FO-4400U
FO-CS1

SHARP SERVICE MANUAL

No. 00ZFO4400USME

Illustration: FO-4400

FACSIMILE

MODEL FO-4400

MODEL	SELECTION CODE	DESTINATION
FO-4400	U	U.S.A./Canada

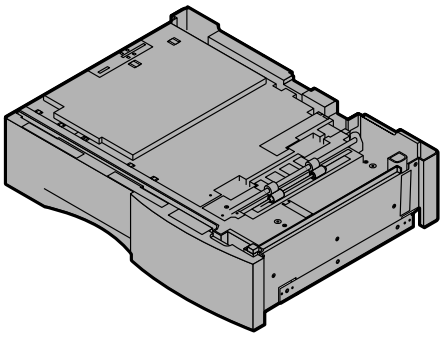

Illustration: FO-CS1

OPTION:PAPER CASSETTE

MODEL FO-CS1

OPTION

Toner cartridge:	**FO-50ND**
Drum cartridge:	**FO-47DR**
Option memory:	**FO-8MK**
Verification stamp:	**FO-45VS**
Paper cassette:	**FO-CS1**

CAUTION

This laser printer is a class 1 laser product that complies with 21CFR 1040.10 and 1040.11 of the CDRH or IEC60825-1 standard. This means that this machine does not produce a hazardous laser radiation. The use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This laser radiation is not a danger to the skin, but when an exact focusing of the laser beam is achieved on the eyes retina, there is danger of spot damage to the retina.

The following cautions must be observed to avoid exposure of the laser beam to your eyes at the time of servicing.

1) When a problem in the laser optical unit has occurred, the whole optical unit must be exchanged as a unit, not an individual part.
2) Do not look into the machine with the main switch turned on after removing the toner/developer unit and drum cartridge.
3) Do not look into the laser beam exposure slit of the laser optical unit with the connector connected when removing and installing the optical system.
4) The cover of Laser Printer Unit contains the safety interlock switch.

   Do not defeat the safety interlock by inserting wedges or other items into the switch slot.

Laser Wave Length : 770-795 nm
Laser Pulse Times : 51.3 ns
Laser Output Power : 5 mW

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

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CAUTION FOR BATTERY REPLACEMENT

(Danish) ADVARSEL !
Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.

(English) Caution !
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type
recommended by the equipment manufacturer.
Discard used batteries according to manufacturer's instructions.

(Finnish) VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

(French) ATTENTION
Il y a danger d'explosion s' il y a remplacement incorrect
de la batterie. Remplacer uniquement avec une batterie du
même type ou d'un type recommandé par le constructeur.
Mettre au rébut les batteries usagées conformément aux
instructions du fabricant.

(Swedish) VARNING
Explosionsfare vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens
instruktion.

(German) Achtung
Explosionsgefahr bei Verwendung inkorrekter Batterien.
Als Ersatzbatterien dürfen nur Batterien vom gleichen Typ oder
vom Hersteller empfohlene Batterien verwendet werden.
Entsorgung der gebrauchten Batterien nur nach den vom
Hersteller angegebenen Anweisungen.

PRECAUTIONS FOR USING LEAD-FREE SOLDER

① Employing lead-free solder

The **Power supply PWB** of this model employs lead-free solder. This is indicated by the "LF" symbol printed on the PWB and in the service manual.

The suffix letter indicates the alloy type of the solder.

Example:

Sn-Ag-Cu Indicates lead-free solder of tin, silver and copper.

② Using lead-free solder

When repairing a PWB with the "LF" symbol, only lead-free solder should be used. (Using normal tin/lead alloy solder may result in cold soldered joints and damage to printed patterns.)

As the melting point of lead-free solder is approximately 40ºC higher than tin/lead alloy solder, it is recommended that a dedicated bit is used, and that the iron temperature is adjusted accordingly.

③ Soldering

As the melting point of lead-free solder (Sn-Ag-Cu) is higher and has poorer wettability (flow), to prevent damage to the land of the PWB, extreme care should be taken not to leave the bit in contact with the PWB for an extended period of time. Remove the bit as soon as a good flow is achieved.

The high content of tin in lead free solder will cause premature corrosion of the bit.

To reduce wear on the bit, reduce the temperature or turn off the iron when it is not required.

Leaving different types of solder on the bit will cause contamination of the different alloys, which will alter their characteristics, making good soldering more difficult.

It will be necessary to clean and replace bits more often when using lead-free solder. To reduce bit wear, care should be taken to clean the bit thoroughly after each use.

CHAPTER 1. GENERAL DESCRIPTION

[1] Specifications

- **GENERAL**

Automatic dialing: Conventional Auto Dialing:
Rapid Key Dialing: 59 numbers
Speed Dialing: 75 numbers
Personal Auto Dial Books: 10 books
(59 Rapid Keys, 16 Speed Dial numbers per book)

Memory size* : 2 MB (approx. 124 pages)
Optional memory: FO-8MK (8 MB; approx. 500 pages)

Modem speed: 33,600 bps (max.) with automatic fallback to lower speeds

Transmission time* : Approx. 3 seconds

Toner cartridge yield: (continuous printing, 4% page coverage, letter paper) **Initial starter cartridge** (included with fax machine): Approx. 3000 pages
Replacement cartridge (FO-50ND): Approx. 6000 pages

Drum cartridge yield: **Initial starter cartridge** (included with fax machine): 20,000 pages (avg.)
Replacement cartridge (FO-47DR): 20,000 pages (avg.)

Resolution: **Horizontal:**
203 pixels/inch (8 dots/mm)
Vertical:
Standard: 98 lines/inch (3.85 lines/mm)
Fine/Halftone: 196 lines/inch (7.7 lines/mm)
Super fine: 391 lines/inch (15.4 lines/mm)

Automatic document feeder: Letter paper (20 lb): Max. 50 pages
Legal paper: Max. 20 pages
(Note: 11" x 17" paper must be loaded one page at a time.)

Paper capacity: 250 sheets (20 lb)
(500-sheet cassette available as option)

Compression scheme: MMR, MR, MH, Sharp (H2)

Halftone (grayscale): 64 levels

Applicable telephone line: Public switched telephone network

Compatibility: ITU-T (CCITT) G3 mode, Super G3 mode

Printing resolution: **Horizontal:** 406 lines/inch (16 lines/mm)
Vertical: 391 lines/inch (15.4 lines/mm)

Input document size: Automatic feeding:
Width: 5.8 to 10.1" (148 to 256mm)
Length: 5.0 to 14.3" (128 to 364 mm)
Manual feeding:
Width: 5.8 to 11.0" (148 to 279 mm)
Length: 5.0 to 19.0" (128 to 483 mm)

Effective scanning width: 8.2" (208 mm) max.

Effective printing width: 8.0" (203 mm) max.

Reception modes: Auto/Manual

Instascan speed: 1.3 sec/page (letter paper; scan time only, excludes document feeding time)

Full Dual Access: Yes

Copy function: Single/Multi/Sort (99 copies/page)

Power requirements: 120 V AC, 60 Hz

Operating temperature: 50 - 86°F(10 - 30°C)

Humidity: 20 to 85 % RH

Power consumption: Stand-by: 9 W
Maximum: 760 W

Dimensions: Width: 21.5" (546 mm)
Depth: 16.2" (412 mm)
Height: 13.6" (346 mm)
(Not including paper tray or attachments)

Weight: Approx. 31.3 lbs. (14.2 kg)
(Not including supplies paper tray or attachments)

* Based on ITU-T Test Chart #1 at standard resolution, excluding time for protocol signals (i.e., ITU-T phase C time only).

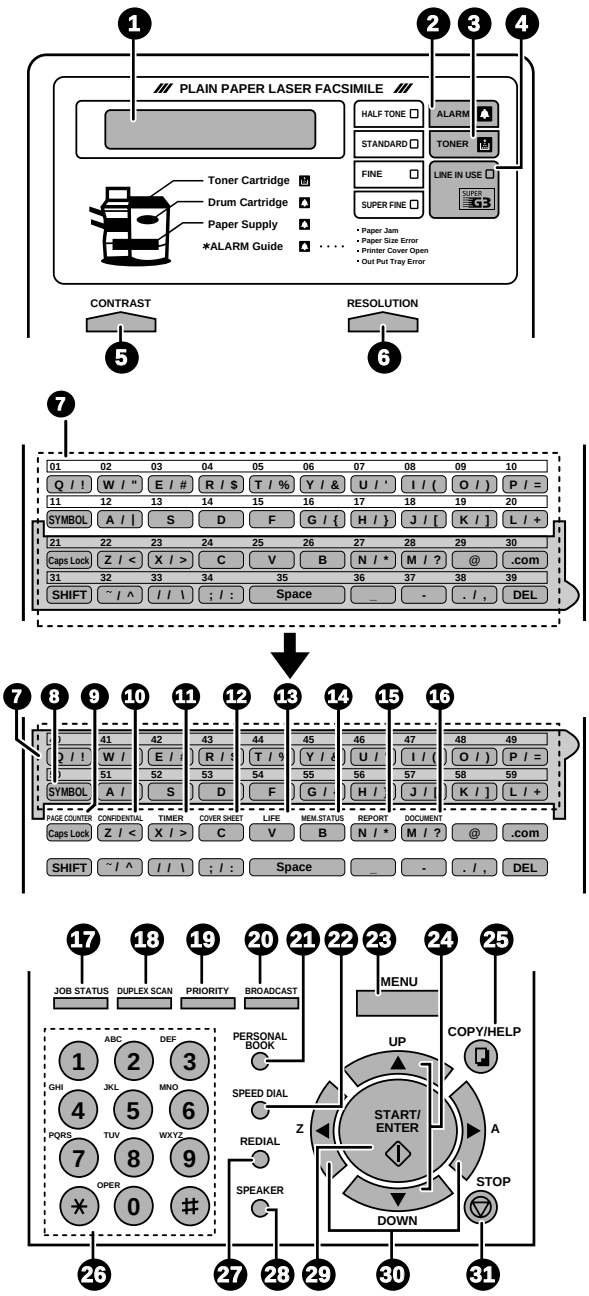
<IMPORTANT PLEASE READ FIRST>

To avoid problems with supplies, please don't use supplies from other units. Please use new supplies, when supply changes are required.

[2] Life of consumable

Section	Part	Estimated Life	Replaced by
Toner cartridge	Replacement cartridge (FO-50ND)	6,000 prints (at Letter/4% chart)	User
Drum cartridge	Replacement cartridge (FO-47DR)	20,000 prints (at Letter/4% chart)	User
Paper feed	Transfer roller (Refer to the P/G No. 10-8) (0KW4127410302)	50,000 prints	Service Engineer
Fuser	Fusing unit (Refer to the P/G No. 9-14) (0KW4127035501)	50,000 prints	Service Engineer
Paper transport	Paper transfer roller (Refer to the P/G No. 8-6) (0KW4127300101)	Cleaning as needed	————
Unit	FO-4400	5 years or 75,000 prints of early either	————

[3] Operation panel

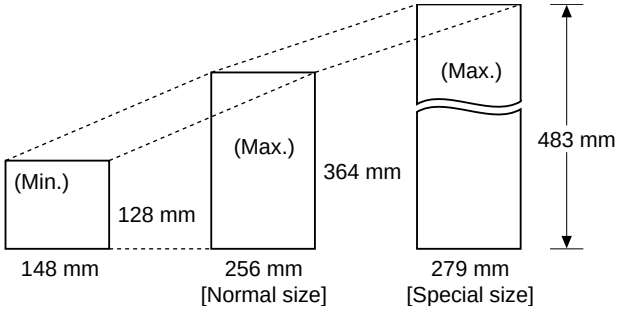


1. **Display**
   This displays messages and prompts to help you operate the machine.
2. **ALARM indicator**
   This blinks when one of the paper sources is empty or the drum cartridge is near the end of its life (printing is still possible). This lights steadily when the drum cartridge has reached the end of its life, all paper sources are empty, the print compartment cover is open, or a paper jam has occurred (printing is not possible). A message will appear in the display to indicate the problem.
3. **TONER indicator**
   This blinks when the toner cartridge nears empty, and lights steadily when the toner cartridge needs replacement.
4. **LINE IN USE light**
   This lights when the fax machine is using the telephone line.
5. **CONTRAST key**
   Press this key to adjust the contrast before sending or copying a document.
6. **RESOLUTION key**
   Press this key to adjust the resolution before sending or copying a document. An indicator will light next to the selected setting (HALFTONE, STANDARD, FINE or SUPER FINE).
7. **Rapid Dial Keys**
   Press one of these keys to dial a fax number automatically. (Note that you must attach the Rapid Key labels.) When navigating through the display menu, a Rapid Key can also be pressed in place of the numeric keys to enter a two-digit number (for example, you can press Rapid Key 01 to enter the number “01”).
8. **SYMBOL key**
   When entering a name, press this key to enter the symbol on a letter key (the character to the right of the slash). Press the key again to turn off symbol entry mode.
9. **PAGE COUNTER key**
   Press this key to include a slash and the total number of pages after each page number on the pages of a transmitted document.
10. **CONFIDENTIAL key**
    Press this key to send or print out a confidential document.
11. **TIMER key**
    Press this key to set an operation to be performed automatically at a later time.
12. **COVER SHEET key**
    Press this key to include a cover sheet when sending a fax.
13. **LIFE key**
    Press this key, followed by (1), to check the total number of pages printed by the fax machine.
14. **MEM. STATUS key**
    Press this key to check the status of fax transmission jobs, copy jobs, and fax receptions. This key can also be used to cancel a job.
15. **REPORT key**
    Press this key to print out a report on the most recently completed transmission or reception.
16. **DOCUMENT key**
    Press this key to transmit a document directly from the feeder without reading it into memory.
17. **JOB STATUS key**
    Two types of information appear in the display: prompts related to operations you are performing, and information about how the fax machine is using the telephone line (transmitting, receiving, etc.). Press this key to change between the two types of information.
18. **DUPLEX SCAN key**
    Press this key to transmit or copy a two-sided document.
19. **PRIORITY key**
    Press this key when you need to transmit a document ahead of other documents waiting in memory for transmission.
20. **BROADCAST key**
    Press this key to send a fax to a group of receiving fax machines.
21. **PERSONAL BOOK**
    Press this key to use or store an auto-dial number in a personal book. If the book has a passcode, enter the passcode; otherwise, select the book with ◀ or ▶ and press START/ENTER.
22. **SPEED DIAL key**
    Press this key to dial a Speed Dial number.
23. **MENU key**
    Press this key to select special functions and settings.
24. **UP and DOWN arrow keys**
    Volume setting: Press these keys to change the speaker volume when the **SPEAKER** key has been pressed, or the ringer volume at any other time.
25. **COPY/HELP key**
    When a document is in the feeder, press this key to make a copy of a document. At any other time, press this key to print out the Help List, a quick reference guide to the operation of your fax machine.
26. **Dial keypad (numeric keys)**
    Use these keys to dial and program fax numbers.
27. **REDIAL key**
    Press this key to automatically redial the last number dialed.
28. **SPEAKER key**
    Press this key when transmitting a document by Normal Dialing to listen to the line and verify the response of the receiving fax machine.
29. **START/ENTER key**
    Press this key to begin fax transmission when using Speed Dialing, Direct Keypad Dialing, or Normal Dialing. This key is also used to select settings and complete entries when storing names and numbers.
30. **Left and right arrow keys**
    Auto-dial numbers: Press these keys to search for an auto-dial number when sending a fax.
    MENU key settings: Press these keys after pressing the **MENU** key to scroll through the **MENU** key settings.
31. **STOP key**
    Press this key to cancel an operation before it is completed.

[4] Transmittable documents

1. Document Sizes

Normal size	width	5.8" – 10.1" (148 – 256 mm)
	length	5.0" – 14.3" (128 – 364 mm)



* With special sizes, only one sheet can be fed into the machine at a time. Insert next page into feeder as current page is being scanned.

2. Paper Thickness & Weight

		Product specifications	
	Indication	Lower Limit	Upper Limit
Weight indication	Japanese indication Size 4 × 6	45kg paper	70kg paper
	Metric system indication	52g/m^2	80g/m^2
	American indication LB system indication	14 LB	20 LB
Thickness indication	Metric system indication	0.06mm	0.1mm
	Inch system indication	0.0024"	0.0035"
Document size	Document size Range	(148mm × 128mm) ~ W letter (279mm × 483mm)	
		A4 (210mm × 297mm)	
		Letter (216mm × 279mm)	
Number of ADF sheets	Document size Weight	B6 ~ Letter/A4 size	50 sheets
		B4 size/Legal	20 sheets
		W letter size	1 sheet
		90 kg (104g/m^2) or more 135 kg (157g/m^2) or less	1 sheet
Paper quality	Kind	Paper of fine quality/bond paper/ Kent paper	

3. Document Types

- Normal paper

  Documents handwritten in pencil (No. 2 lead or softer), fountain pen, ball point pen, or felt-tipped pen can be transmitted.

  Documents of normal contrast duplicated by a copying machine can also be transmitted.
- Diazo copy (blueprint)

  Diazo copy documents of a normal contrast may be transmitted.
- Carbon copy

  A carbon copy may be transmitted if its contrast is normal.

4. Cautions on Transmitting Documents

- Documents written in yellow, greenish yellow, or light blue ink cannot be transmitted.
- Ink, glue, and correcting fluid on documents must be dry before the documents can be transmitted.
- All clips, staples and pins must be removed from documents before transmission.
- Patched (taped) documents should be copied first on a copier and then the copies used for transmission.
- All documents should be fanned before insertion into the feeder to prevent possible double feeds.

5. Automatic Document Feeder Capacity

Number of pages that can be placed into the feeder at anytime is as follows:

Normal size: max. 50 sheets (14 lbs - 20 lbs)

Special size: single sheet only (manual feed)

NOTES:
- If you need to send or copy more 50 pages, place the additional pages and carefully in the feeder just before the last page is scanned. Do not try to force them in, as this may cause double-feeding or jamming.
- If your document consists of several large or thick pages which must be loaded one at a time, insert each page into the feeder as the previous page is being scanned. Insert gently to prevent doublefeeding.

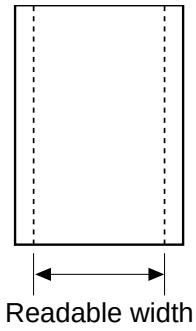
6. Readable Width & Length

The readable width and length of a document are slightly smaller than the actual document size.

Note that characters or graphics outside the effective document scanning range will not be read.

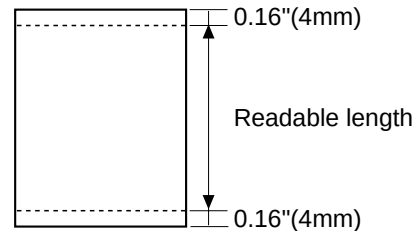
- **Readable width**

8.2" (208 mm) max.



- **Readable length**

This is the length of the document sent minus 0.16" (4 mm) from the top and bottom edges.



[5] Installation

1. Site selection

Take the following points into consideration when selecting a site for this model.

ENVIRONMENT

- The machine must be installed on a level surface.
- Keep the machine away from air conditioners, heaters, direct sunlight, and dust.
- Provide easy access to the front, back, and sides of the machine. In particular, keep the area in front of the machine clear, or the original document may jam as it comes out after scanning.
- The temperature should be between 50° and 86°F (10° and 30°C).
- The humidity should be between 30% and 85% (without condensation).

ELECTRICITY

AC 120 V, 60 Hz, grounded (3-prong) AC outlet is required.

Caution!

- Connection to a power source other than that specified will cause damage to the equipment and is not covered under the warranty.
- If your area experiences a high incidence of lightning or power surges, we recommend that you install a surge protector for the power and telephone lines. Surge protectors can be purchased at most telephone specialty stores.

TELEPHONE JACK

A standard RC11C telephone jack must be located near the machine. This is the telephone jack commonly used in most homes and offices.

- Plugging the fax machine into a jack which is not an RC11C jack may result in damage to the machine or your telephone system. If you do not know what kind of jack you have, or need to have one installed, contact the telephone company.

If the machine is moved from a cold to a warm place...

If the machine is moved from a cold to a warm place, it is possible that the reading glass may fog up, preventing proper scanning of documents for transmission. To remove the fog, turn on the power and wait approximately 2 hours before using the machine.

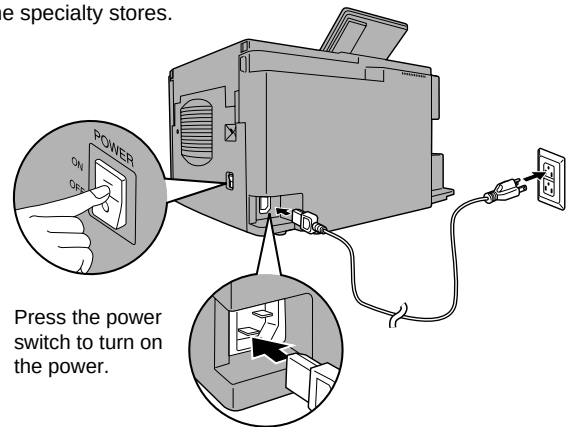
2. Assembly and connections

① **Connecting the power cord**

Connect the female end of the power cord to the fax machine as shown. Insert the male end into a 120 V, 60 Hz, grounded (3-prong) AC outlet.

Important!: The fax machine requires its own dedicated power outlet. The power outlet must not be shared with any other devices. In particular, do not use an extension cord to connect multiple devices to the outlet.

Note: If your area experiences a high incidence of lightning or power surges, we recommend that you install surge protectors for the power and telephone lines. Surge protectors can be purchased at most telephone specialty stores.

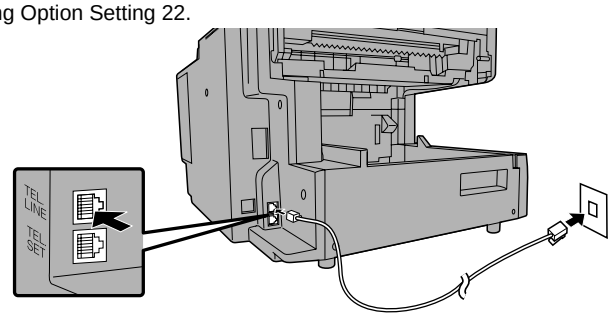


Press the power switch to turn on the power.

② **Connecting the telephone line cord**

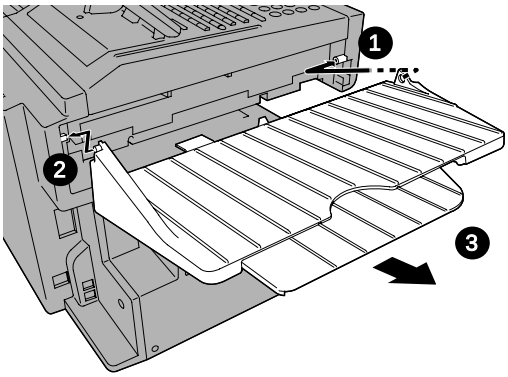
Insert one end of the line cord into the jack on the back of the machine marked **TEL. LINE**. Insert the other end into a standard (RJ11C) single-line wall telephone jack.

Note: The fax machine is set for touch-tone dialing. If you are on a pulse dial (rotary) line, you must set the fax machine for pulse dialing by changing Option Setting 22.



③ **Attaching the ADF exit tray**

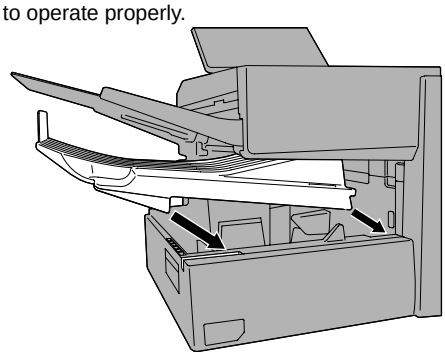
Insert the protrusion on the right side of the machine into the hole in the right side of the ADF exit tray ❶, then bend the tray slightly and insert so that the protrusion on the left side of the machine goes into the hole on the left side of the ADF exit tray ❷. Pull out the tray extension ❸.



④ **Attaching the received document tray**

Slide the received document tray into the machine as shown. When it stops, lift the end slightly and push in so that the tray locks into place.

Important!: The received document tray must be attached for the fax machine to operate properly.



⑤ **Verification Stamp option (FO-45VS)**

Note: This feature is available as an option. Consult your dealer if you wish to use this feature.

When transmitting a document, you can have the fax machine stamp each document page as it is scanned. After scanning, you can check to see if all document have been stamped to verify that no double feeds occurred. (A double feed occurs when two pages are fed through the scanner at once, which means that one of the pages is not scanned.)
To use this function, have your dealer install the Verification Stamp option, and then set Option Setting 29 to ON.

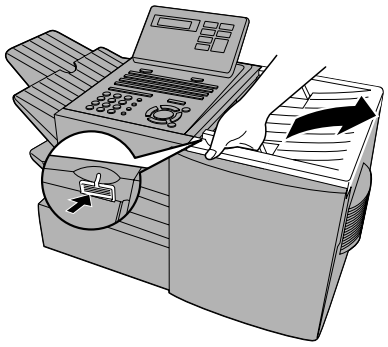
3. Installing the printer cartridges (Toner cartridge: FO-50ND) (Drum cartridge: FO-47DR)

Follow the steps below to install or replace the toner and drum cartridges.

- The initial starter toner cartridge included with the fax machine can print approximately 3000 letter-size pages (4% coverage of each page; continuous printing).
- The replacement toner cartridge (FO-50ND) can print approximately 6000 letter-size pages.
- The drum cartridge (FO-47DR) can print approximately 20,000 letter-size pages.

① Press the cover release to open the print compartment cover.

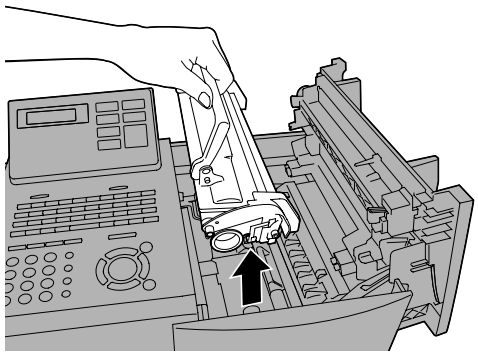
- **Caution!** The fusing unit inside the print compartment becomes very hot during operation. Be careful not to touch the inside of the compartment.

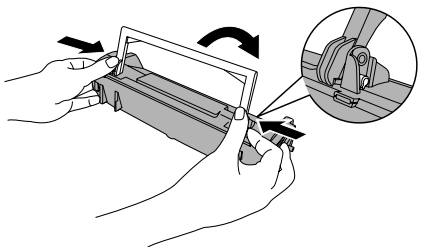


② If you are replacing the toner cartridge, remove the old cartridge and dispose of it according to local regulations.

Go directly to STEP 6 if you are only replacing the toner cartridge and not the drum cartridge.

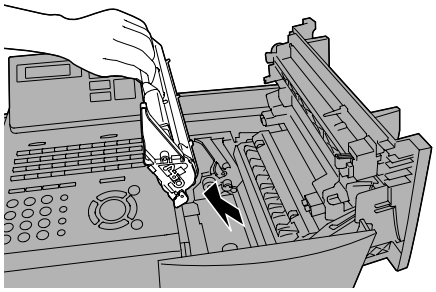
- If you are replacing the drum cartridge but not the toner cartridge, remove the toner cartridge and place it on a sheet of paper.





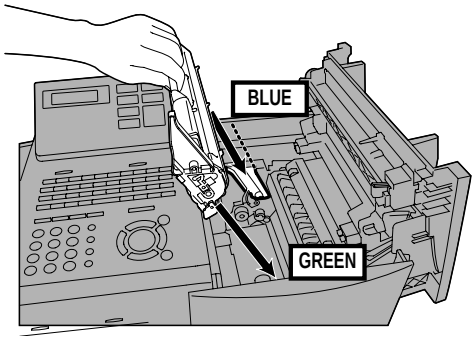
To make the cartridge more compact for disposal, press the buttons on the ends of the handle and fold the handle down.

③ If you are replacing the drum cartridge, remove the old cartridge and dispose of it according to local regulations.

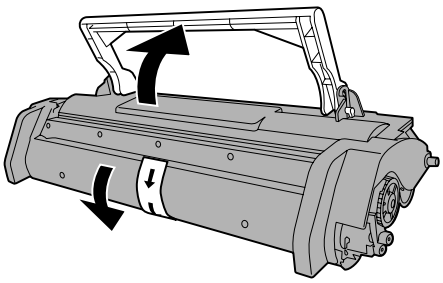


④ Remove the new drum cartridge from its packaging. Insert the drum cartridge into the print compartment.

- **Caution!** Excessive exposure to light will damage the drum cartridge. Install the cartridge promptly after removing it from its packaging.
- Make sure the drum cartridge is inserted in as far as it will go.

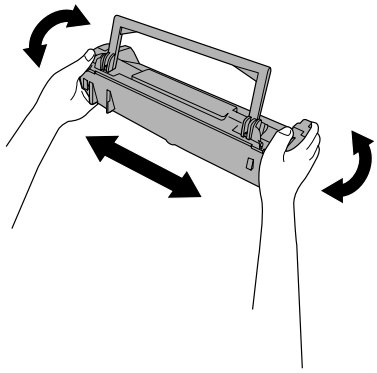


⑤ If you are installing a new toner cartridge, remove the new toner cartridge from its packaging. Remove the tape from the cartridge and then open the cartridge handle so that it stands straight up.



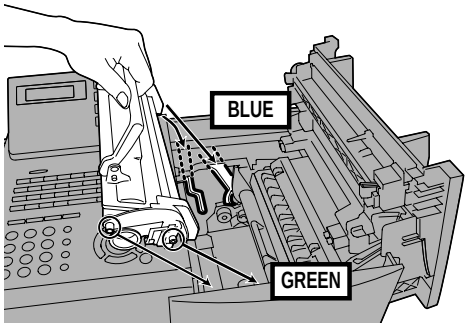
⑥ Shake as indicated by the arrows to distribute the toner evenly within the cartridge.

- If the toner is still lumpy after shaking, the gears in the cartridge may make a noticeable sound when the print compartment cover is closed after installing the cartridge. This is normal and does not indicate a problem.

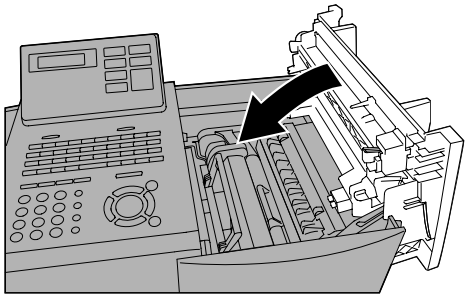


⑦ Hold the toner cartridge by the handle and insert it into the print compartment.

- Make sure the toner cartridge clicks into place.
- The handle can be left standing up.



⑧ Close the print compartment cover.



⑨ Reset the drum counter by pressing LIFE (flip up the Rapid Key overlay), 3, and START/ENTER.

- **Note:** The toner counter automatically resets each time you replace the toner cartridge. There is normally no need to reset the toner counter manually. Should you find it necessary to manually reset the toner counter, press LIFE (flip up the Rapid Key overlay), 2, and START/ENTER.

Note: The print compartment cover may become noticeably warm if a large number of pages are successively printed. This is normal and does not indicate a problem in the machine.

⑩ When to replace the toner cartridge

When the toner cartridge nears empty (about 100 pages can still be printed), the toner cartridge indicator on the operation panel will blink. When the toner cartridge is empty, the toner cartridge indicator will light steadily and REPLACE TONER will appear in the display. Printing will no longer be possible. Use the following replacement toner cartridge.

Sharp FO-50ND toner cartridge

Hint:

When the toner cartridge nears empty, try taking it out of the machine and shaking it. This may increase the number of pages that can be printed before the toner runs out.

⑪ When to replace the drum cartridge

When the drum cartridge nears the end of its life, the ALARM indicator on the operation panel will blink and DRUM LIFE REACHED will appear in the display. (this message appears when approximately 1000 pages can still be printed). Use the following replacement drum cartridge.

Sharp FO-47DR drum cartridge

4. Loading printing paper

You can load up to 250 sheets of letter or legal paper (max. 20 lbs.) in the paper tray.

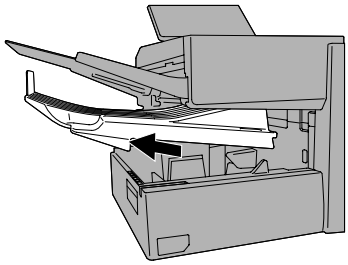
- A paper cassette is available as an option. Up to 500 sheets of letter or legal paper can be loaded in the paper cassette. To have the cassette installed, consult your dealer.

  Important: Do not use the back side of paper that has already been printed on.

  Note: If you need to add paper to the tray or cassette while paper still remains, remove the remaining paper and combine it into a single stack with the new paper.

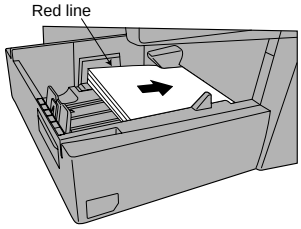
Loading paper in the paper tray

① Remove the received document tray.

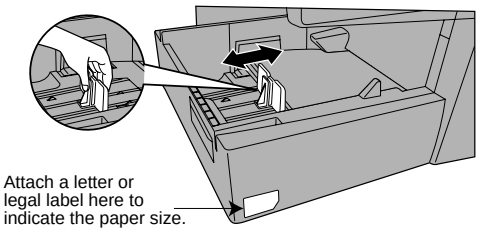


② Insert a stack of paper into the tray, print side up.

- **Important!** The stack of paper must not be higher than the red line on the paper tray.

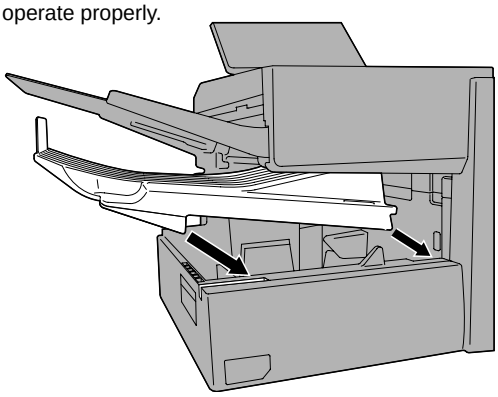


③ Squeeze the paper guide and move it to match the length of the paper you are loading.



④ Replace the received document tray.

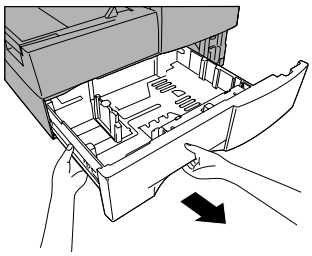
- The received document tray must be attached for the fax machine to operate properly.



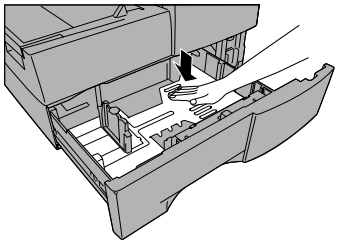
Loading paper in the paper cassette (if installed FO-CS1)

Note: To use A4 paper in the paper cassette, you must have a service technician adjust the cassette.

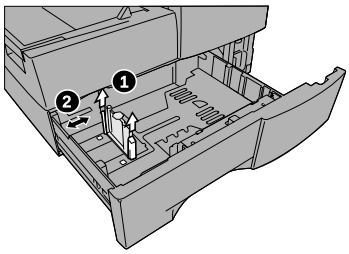
① Grasp the hand-hold on the cassette and pull the cassette out until it stops.



② Push the pressure plate down until it locks into position.

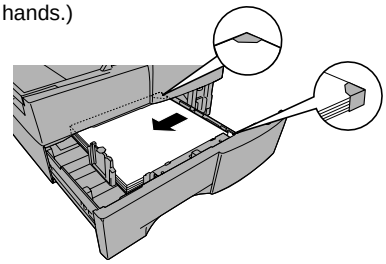


③ Squeeze the paper guide and pull up to move it to the appropriate holes for the length of the paper. Push the guide down into the holes.

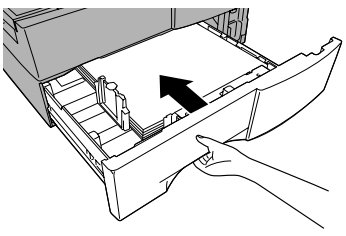


④ Place a stack of paper in the cassette, print side up.

- Make sure the stack of paper is not higher than the two tabs on the paper guide and the two metal tabs. If it is, remove some of the paper.
- If you find it difficult to load the paper, remove the cassette from the machine. (Pull the cassette out as far as it will go, grasp the left side of the cassette with your left hand, and then lift it up and out with both hands.)



⑤ Push the cassette back into the machine, making sure it clicks into place.



5. Clearing paper jams

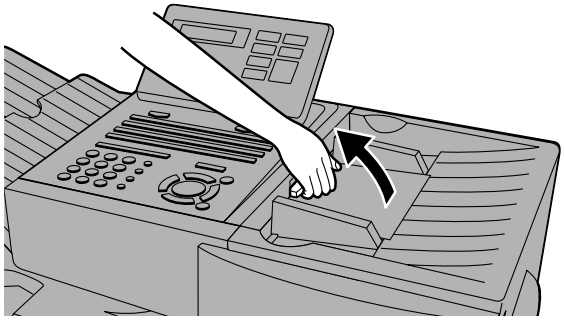
Clearing a jammed document

If the original document doesn't feed properly during transmission or copying, or REMOVE ORIGINAL(S) appears in the display, fist try pressing (START/ENTER) . If the document doesn't feed out, open the operation panel and remove it.

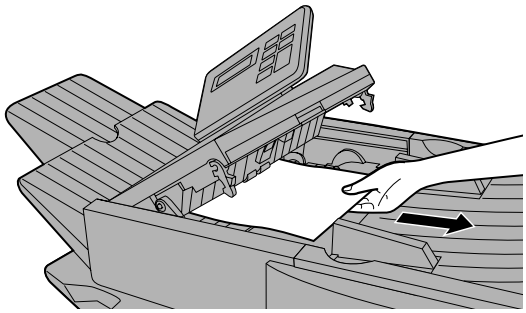
Important: Do not try to remove a document without opening the operation panel. This may damage the feeder mechanism.

① Open the operation panel.

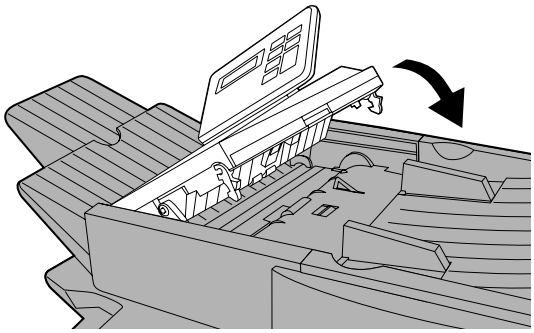
- Squeeze the release marked **PANEL RELEASE** and pull up.



② Remove the document.



③ Close the operation panel, making sure it clicks into place.

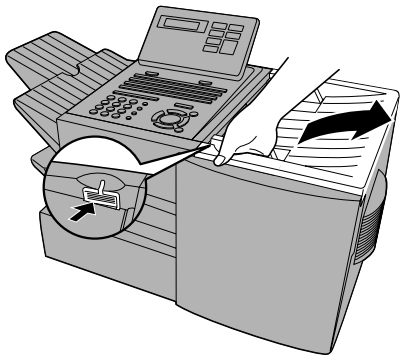


Clearing a jammed printing paper

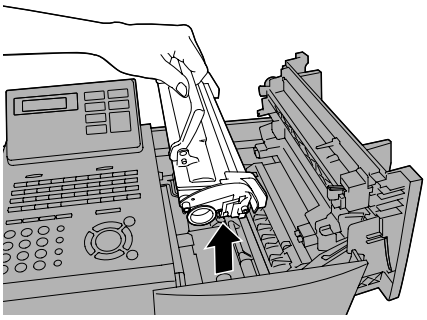
If the printing paper jams, PAPER JAM will appear in the display. Follow the steps below to clear the jam.

① Press the green release and open the print compartment cover.

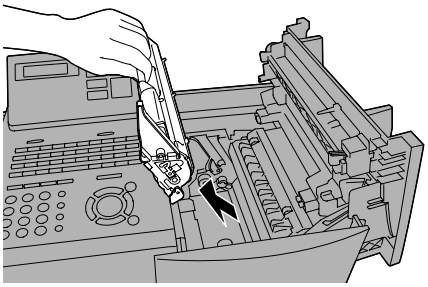
- **Caution!** The fusing unit inside the print compartment becomes very hot during operation. Be careful not to touch the inside of the compartment.



② Remove the toner cartridge and place it on a sheet of paper.

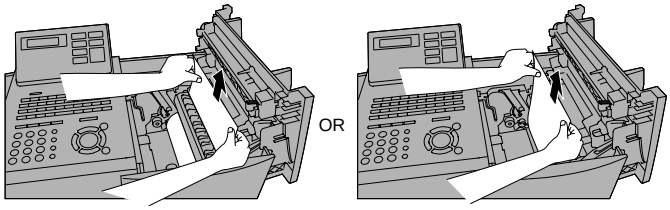


③ Remove the drum cartridge.



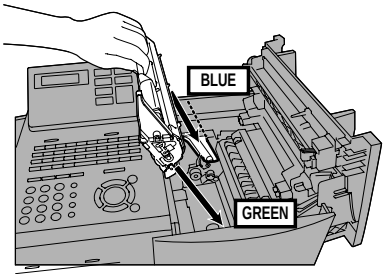
④ Remove the jammed paper.

- Make sure no torn pieces of paper remain in the print compartment and rollers.

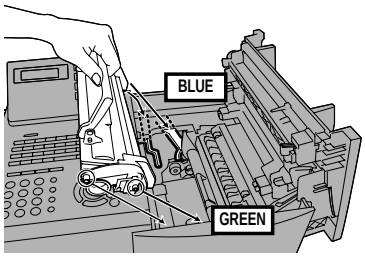


⑤ Replace the drum cartridge.

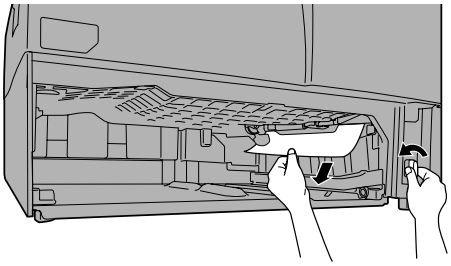
- Make sure the drum cartridge is inserted in as far as it will go.



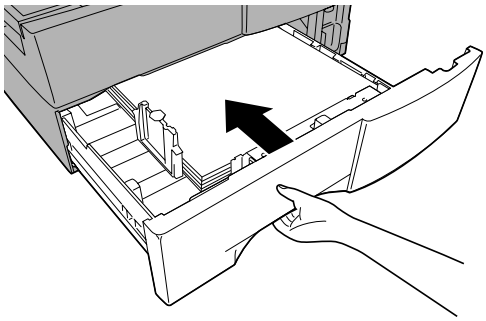
⑥ Replace the toner cartridge and then close the print compartment cover.



⑦ If you have a paper cassette and the display still indicates that paper is jammed, pull out the cassette and remove the jammed paper.



⑧ Replace the paper cassette.

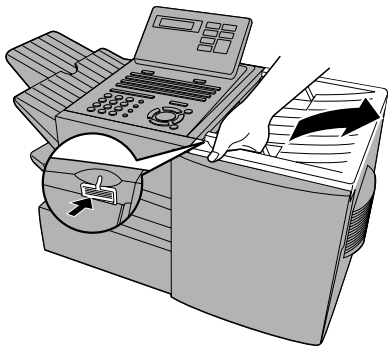


6. Installing the paper cassette (FO-CS1)

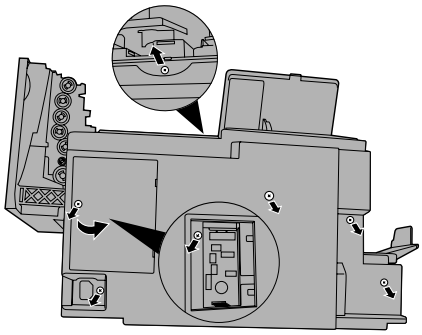
Installing the second paper cassette

Important: Be sure to turn off the power and unplug the power cord before proceeding.

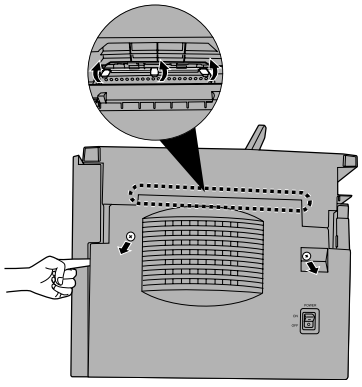
① Press the cover release to open the print compartment cover.



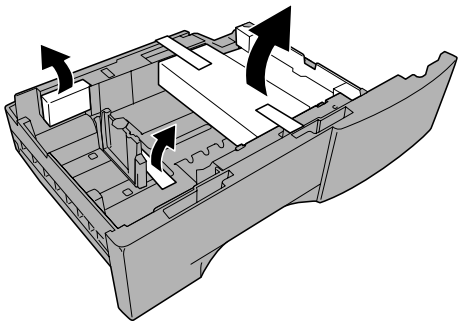
② Remove 6 screws from the rear cover.
Remove the small cover on the left side of the rear cover, and then remove the screw underneath. Remove the rear cover.



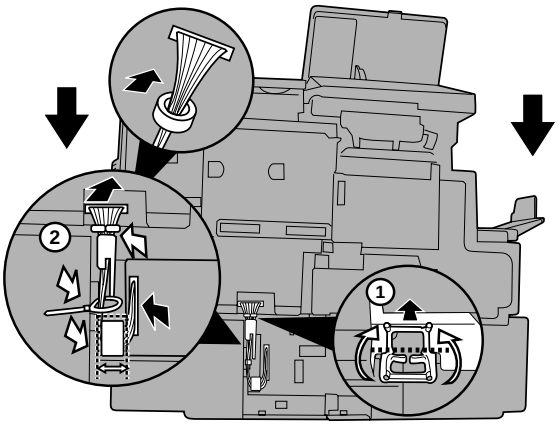
③ Remove 2 screws from the right cover of the machine.
From inside the print compartment, push the 3 tabs indicated in the blowup out. (Note: The blowup shows the inside of the print compartment.) Insert your left index finger in between the cover and the machine as shown, and then close the print compartment cover. With your index finger still inserted, grasp both sides of the cover and pull it off.



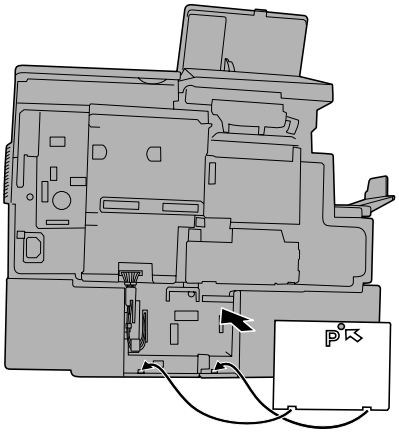
④ Remove the packing material and tape from the paper cassette.



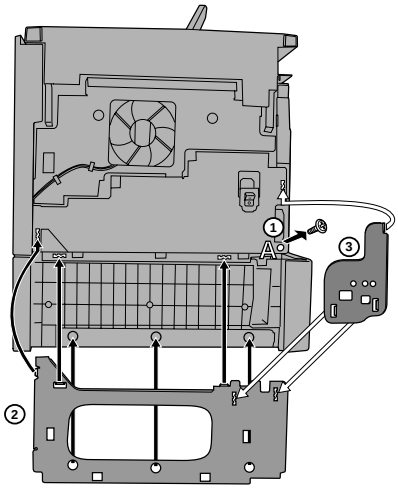
⑤ Place the machine on top of the cassette.
1. Insert the cable guide into the cut-out in the edge of the metal plate, and then fold it in half and hook the top and bottom edges together.
2. Insert the 15pin cable through the ferrite core, and then connect the cable to the connectors on the machine and the cassette as shown. Position the ferrite core in the gap between the bottom left-hand corner of the circuit board and the side of the compartment. Insert the cable into the cable guide, and then insert the remainder of the cable into the slot in the cassette below the cable guide. Tie the wires with the band.



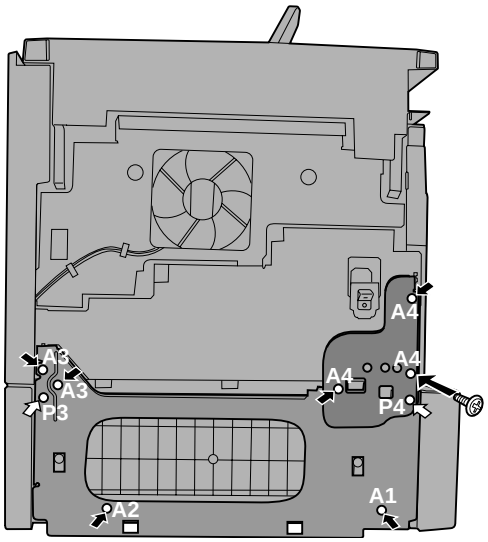
⑥ Replace the small cover over the circuit board and secure it with a 10 mm screw.



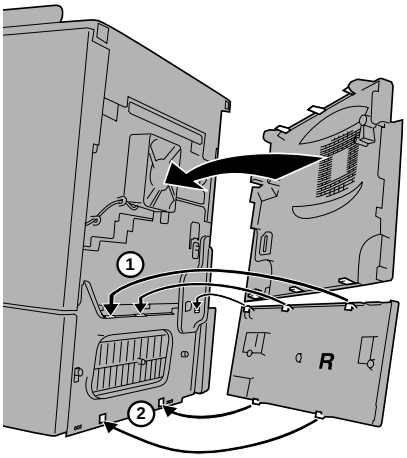
⑦ Attach the support plates to the right side of the machine.
1. Remove the indicated screw.(In Step 8 below, replace it in the same hole.)
2. Mount the large plate, making sure that the guides fit into the holes as shown.
3. Mount the small plate, making sure that the guides fit into the holes as shown.



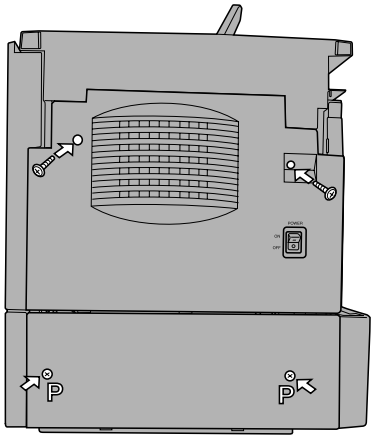
⑧ Secure the plates with screws as shown. Use 6 mm screws for the holes marked with “A”, and 10 mm screws for the holds marked with ““P”. Secure the screws in the order indicated by the numbers.



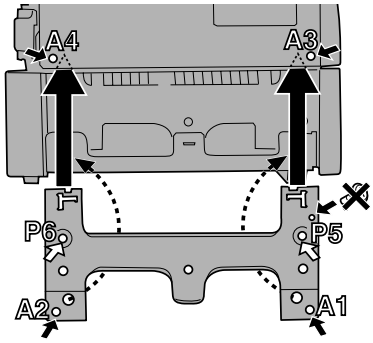
⑨ Replace the right side cover on the machine, inserting the tabs into the holes.
Attach the longer cassette cover to the right side of the cassette, inserting the tabs into the holes (first top, then bottom).



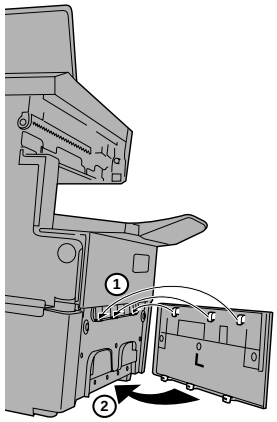
⑩ Replace the screws in the side cover on the machine.
Secure the cassette cover with two 10 mm screws.



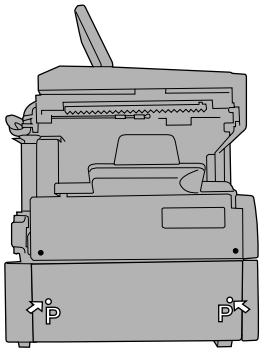
⑪ Attach the support plate to the left side of the machine, inserting the top edges of the plate under the machine housing. Make sure that the guides fit into the holes as shown.
Secure the plate with screws as shown. Use 6 mm screws for the holes marked with “A”, and 10 mm screws for the holes marked with “P”. Secure the screws in the order indicated by the numbers.
(Note that the top hole on the right does not require a screw.)



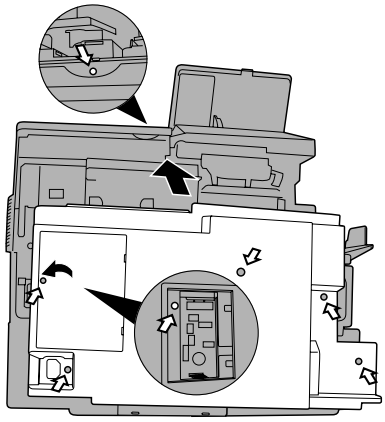
⑫ Attach the shorter cassette cover to the left side of the cassette, inserting the tabs into the holes (first top, then bottom).



⑬ Secure the cassette cover with two 10 mm screws.



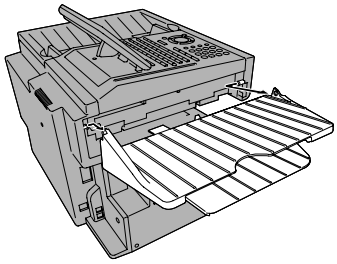
⑭ Replace the rear cover (replace the screw under the small cover on the left side of the rear cover first, and then replace the small cover).



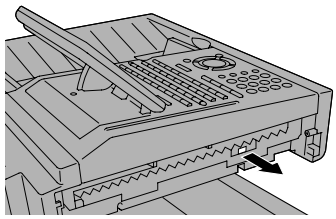
7. Replacing the Verification Stamp (FO-45VS)

If you are using the Verification Stamp function, you will need to replace the ink cartridge in the stamp unit when it runs out of ink (when the stamped mark on original documents becomes faint). A new ink cartridge can be obtained from your dealer.

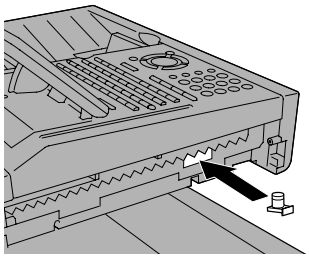
① Remove the ADF exit tray.



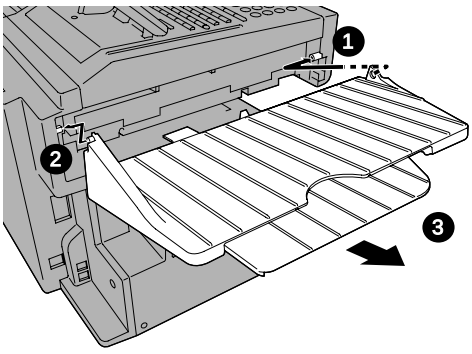
② Press down on the protruding tab of the green ink cartridge and pull the cartridge out with your fingers.



③ Insert the new ink cartridge into the machine (make sure that the tab is facing out).



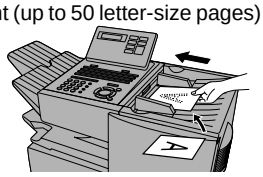
④ Replace the ADF exit tray.



[6] Quick reference guide

SENDING FAXES

Place your document (up to 50 letter-size pages) face down in the document feeder.



(Note: For Normal Dialing and Direct Keypad Dialing, you can also load the document after dialing the number.)

Press RESOLUTION or CONTRAST if needed.

Normal Dialing

1. Lift extension phone or press SPEAKER .
2. Dial the fax number (if using an extension phone, dial on the extension phone keypad).
3. Wait for the reception tone (if a person answers, ask them to press their Start key).
4. Press START/ENTER .

Rapid Key Dialing

1. Press the desired Rapid Key.

Speed Dialing

1. Press SPEED DIAL and enter the desired Speed Dial number (press START/ENTER if you entered a 1-digit number).
2. Press START/ENTER .

Direct Keypad Dialing

1. Dial the fax number.
2. Press START/ENTER .

BROADCASTING

1. Load the document and press BROADCAST .
2. Dial destination numbers:
   Press a Rapid Key.
   Press a Group Key.
   Press SPEED DIAL and enter a Speed Dial number (press START/ENTER to complete entry if only one digit is entered).
   Enter a full number and press START/ENTER .
3. When finished, press START/ENTER .
4. Press RESOLUTION or CONTRAST if needed.
5. Press START/ENTER .

STORING AUTO DIAL NUMBERS

1. Press MENU , 3 , 0 , 1 .
2. Press 1 to store a number.
   (Press 2 to clear a number.)
3. To store a Rapid Key number, press the desired Rapid Key.
   To store a Speed Dial number, press SPEED DIAL and enter a number from 1 to 75 (press START/ENTER if you entered a 1-digit number).
   (If clearing a number, select it as explained above and then perform Step 7 and 9.)
4. Enter the full fax number.
5. Press START/ENTER .
6. Enter a name by pressing the letter keys.
7. Press START/ENTER .
8. Press 1 if this is a Chain Dial number.
   Press 2 if this is a regular number.
9. Press STOP repeatedly to exit.

CHAPTER 2. ADJUSTMENTS

[1] Adjustments

General

Since the following adjustments and settings are provided for this model, make adjustments and/or setup as necessary.

1. Adjustments

Adjustments of output voltage (FACTORY ONLY)

1. Install the power supply unit in the machine.
2. Set the recording paper and document.
3. When the document is loaded, power is supplied to the output lines. Confirm that outputs are within the limits below.

Output voltage settings

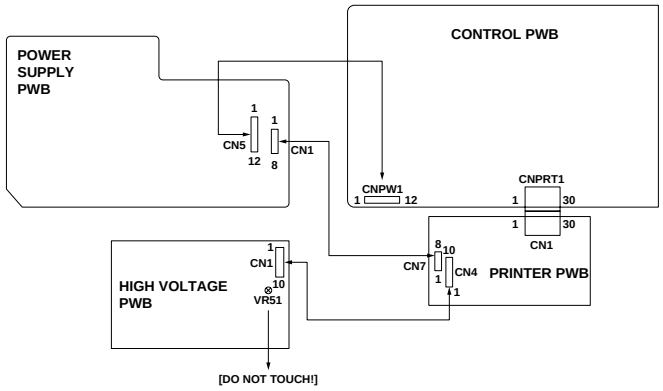


Fig. 1

Output	Voltage limits	Note
+5V MAIN	4.947V~5.25V	CN5 7pin ↔ 8pin
+24V SUB	23.04V~24.96V	CN5 1pin ↔ 2pin

Connector No. / Pin No.	CN4 / CN1
1 / 11	+5V
2 / 10	CH LREM
3 / 9	T VR
4 / 8	T MON V
5 / 7	T MON I
6 / 6	B VR
7 / 5	V REM
8 / 4	C MON
9 / 3	MG
10 / 2	+24V

Connector No. / Pin No.	CN5 / CNPW1
1	+24V SUB
2	MG
3	MG
4	MG
5	+24V MAIN
6	+24V MAIN
7	+5V MAIN
8	DG
9	DG
10	DG
11	+5V MAIN
12	+5V MAIN

Connector No. / Pin No.	CN1 / CN7
1	+24V MAIN
2	MG
3	DG
4	DG
5	+5V MAIN
6	+5V MAIN
7	HEATER ON
8	H-RELAY OFF

2. IC protectors replacement

ICPs (IC Protectors) are installed to protect the CIS unit, panel PWB unit, TX motor drive circuit and verification stamp drive circuit. ICPs protect various ICs and electronic circuits from an overcurrent condition.
The location of ICPs are shown below:

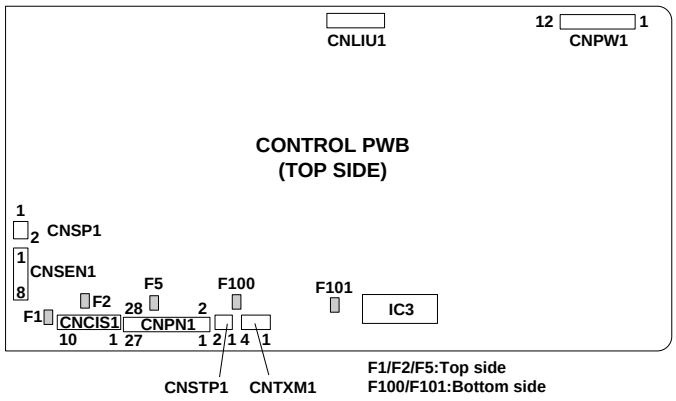


Fig. 2

(1) F1 (ICP-S0.5) F2 (ICP-S1.0) is installed in order to protect IC's from an overcurrent generated in the CIS unit. If F1 or F2 are open, replace it with a new one.
(2) F5 (ICP-S1.0) is installed in order to protect IC's from an overcurrent generated in the panel PWB unit. If F5 is open, replace it with a new one.
(3) F100 (ICP-S1.0) is installed in order to protect IC's from an overcurrent generated in the verification stamp drive circuit. If F100 is open, replace it with a new one.
(4) F101 (ICP-S1.8) is installed in order to protect IC's from an overcurrent generated in the TX motor drive circuit. If F101 is open, replace it with a new one.
In addition to the replacement of F1, F2, F5, F100 and F101, the factor causing F1, F2, F5, F100 and F101 to open must also be repaired. If not, F1, F2, F5, F100 and F101 will open again.
Replacement parts
ICP-S0.5 (Sharp code: VHViCPS05//-1)
ICP-S1.0 (Sharp code: VHViCPS10//-1)
ICP-S1.8 (Sharp code: VHViCPS18//-1)

3. Settings

(1) Dial mode selector

OPTION SETTING: DIAL MODE (Soft Switch No. SW2 DATA No. 1)
Use this to set the fax machine to the type of telephone line you are on.
• The factory setting is "TONE".

(step 1) Select "OPTIONAL SETTING".

KEY: [MENU] (4)

DISPLAY: 4:OPTIONAL SETTING
ENTER #(01-36,▶,◀)

(step 2) Select "DIAL MODE".

KEY: (2)(2)

DISPLAY: 22: DIAL MODE
1=TONE, 2=PULSE

(step 3) Select, using "1" or "2".

KEY: (1)

DISPLAY: TONE SELECTED

KEY: (2)

DISPLAY: PULSE SELECTED

(step 4) End, using the "STOP" key.

KEY: STOP

[2] Diagnostics and service soft switches

1. Operating procedure

Two kinds of diagnoses are supported.

1-1. Fax diagnosis

This diagnosis is concerned with the main body of fax which is used for production and service support.

Entering the diagnostic mode

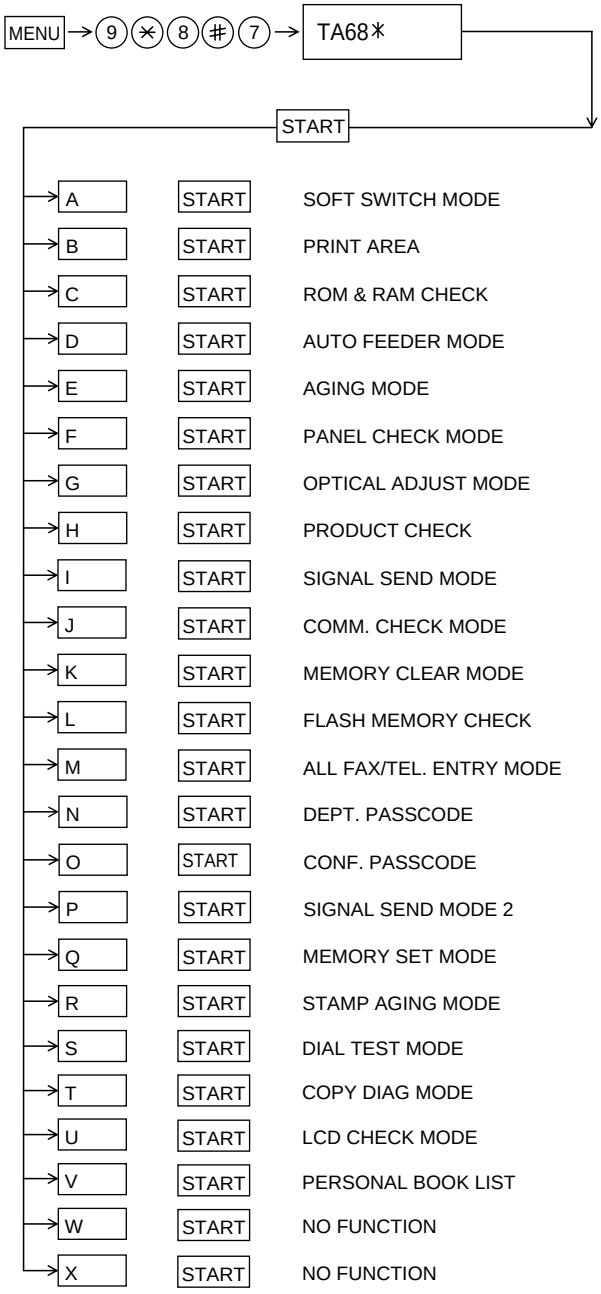
Press MENU → 9 → ✳ → 8 → # → 7 , and the following display will appear.

MAIN: TA68✳

Then press the START key. Select the desired item with the ✳ key and the # key or select with the rapid key.

Enter the mode with the START key.

(Diag・specifications)


MENU → 9 ✳ 8 # 7 → TA68✳
START
A START SOFT SWITCH MODE
B START PRINT AREA
C START ROM & RAM CHECK
D START AUTO FEEDER MODE
E START AGING MODE
F START PANEL CHECK MODE
G START OPTICAL ADJUST MODE
H START PRODUCT CHECK
I START SIGNAL SEND MODE
J START COMM. CHECK MODE
K START MEMORY CLEAR MODE
L START FLASH MEMORY CHECK
M START ALL FAX/TEL. ENTRY MODE
N START DEPT. PASSCODE
O START CONF. PASSCODE
P START SIGNAL SEND MODE 2
Q START MEMORY SET MODE
R START STAMP AGING MODE
S START DIAL TEST MODE
T START COPY DIAG MODE
U START LCD CHECK MODE
V START PERSONAL BOOK LIST
W START NO FUNCTION
X START NO FUNCTION

1-2. Print diagnosis

This diagnosis is concerned with the print which is used for production and service support.

Entering the diagnostic mode

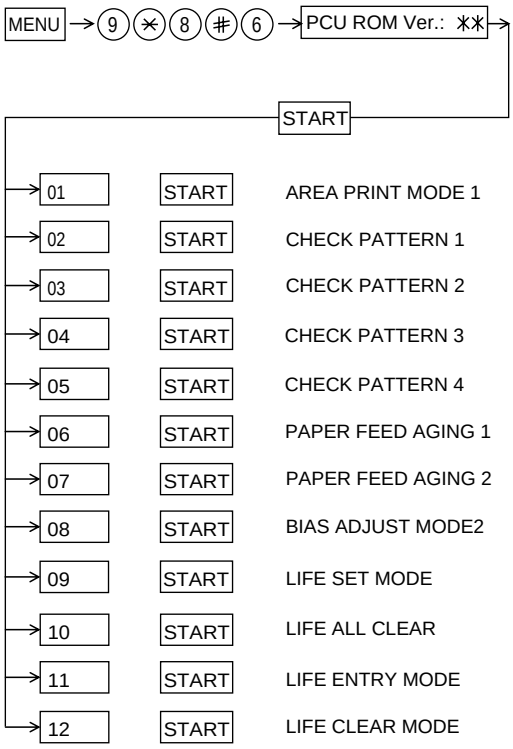
Press MENU → 9 → ✳ → 8 → # → 6 , and the following display will appear.

PCU ROM VER.:✳✳

Then press the START key. Select the desired item with ✳ the key and the # key or select with the rapid key.

Enter the mode with the START key.

(Diag・specifications)


MENU → 9 ✳ 8 # 6 → PCU ROM Ver.: ✳✳
START
01 START AREA PRINT MODE 1
02 START CHECK PATTERN 1
03 START CHECK PATTERN 2
04 START CHECK PATTERN 3
05 START CHECK PATTERN 4
06 START PAPER FEED AGING 1
07 START PAPER FEED AGING 2
08 START BIAS ADJUST MODE2
09 START LIFE SET MODE
10 START LIFE ALL CLEAR
11 START LIFE ENTRY MODE
12 START LIFE CLEAR MODE

Memory clear when power is turned on

Pressing the START and STOP keys, turn on the main power, and the following message will be displayed.

MEMORY CLEAR ?
1 = ALL , 2 = IMAGE , 3 = NO

1 = All the data will be deleted including initially registered data.
2 = Delete the image file to be used in transmission. This will delete all the data related to communication such as reserved transmission or intercepting. However, the data initially registered will not be deleted.
3 = Memory will not be cleared and the machine enters stand-by mode.

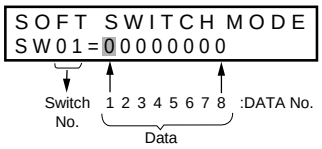
2. Diagnostic items description

2-1. Fax diagnosis

A) Soft switch mode

In this mode, the soft switch are set and the soft switch list is printed.

Soft switch mode screen



① Switch number selection

- Press START key for setting of the next soft switch. If the soft switch number is the final, pressing START key will exit the soft switch mode.
- Enter two digits of a soft switch number to set the switch number. If a switch number of nonexistent soft switch is entered, key error buzzer sounds to reject the input.

② Data number selection

The cursor position shows the data to be set.

Pressing # key or → key moves the cursor to the right. If, however, the cursor is on data number 8, pressing # key or → key shifts the cursor to data number 1 of the next switch number. If the switch number is the final, pressing # key or → key will exit the soft switch mode.

Pressing ⋊ key or ← key moves the cursor to the left. If, however, the cursor is on data number 1, pressing ⋊ key or ← key shifts the cursor to data number 1 of the former switch number. If the switch number is 1, pressing ⋊ key or ← key will not move the cursor and the error buzzer will sound.

③ Data setting method

Press the MENU key, and the data at the position of the cursor will be reversed to 0 when it is 1, or to 1 when it is 0. (If the soft switch can be changed at the bit (Refer to ⑥.), the error buzzer will sound with the process not received.)

④ Outputting method of soft switch list

In the soft switch mode, press the REPORT key, and the soft switch list will be output.

If the recording paper runs out or is clogged, the key error buzzer will sound with the process not received.

⑤ Storage of data

In the following case, the data of the soft switches set will be stored.

- It is shifted to set the next soft switch by pressing the START switch.
- It is shifted to set the next soft switch with the [#] key.
- It is shifted to set the last soft switch with the [⋊] key.
- It is shifted to set another soft switch by inputting two digits as the switch number. (When 2 digits are completely input.)
- Output of the soft switch list is started.

⑥ Inhibition of data change

(This is also applicable for the optional setting.)

In the following case, it is inhibited to change the data with the key error buzzer.

- Switching ON/OFF of ECM during the use of image memory.
- OFF to ON of telephone billing function which is using the image memory is used (Note: In the existing set, the telephone billing code function is specified from OFF to ON when the timer system communication (including the batch communication) is set.)
  Here, the memory is usable when the telephone billing code function is on. It can be set from ON to OFF while the memory is used. However, if setting is practically changed even once, it can not be returned from OFF to ON.
- OFF to ON of department control function during use of image memory.
  (Note: In the existing set, the department control function is set from OFF to ON when the timer communication (including the batch sending) or the memory hold is set.)
- ON to OFF of continuous serial polling function when the continuous serial polling is started.
  (Note: In the existing set, "ON to OFF of the continuous serial polling function when the continuous serial polling is registered" has been applied, but the conditions are now moderated. However, registration is impossible to the program of the new continuous serial polling when the continuous serial polling function is OFF.)
- In addition, change of all soft switches during communication

B) Print area

According to the size of the specified sheet, the effective printing area is printed.

C) ROM & RAM check

This is an item to check if the loaded memory device acts normally.

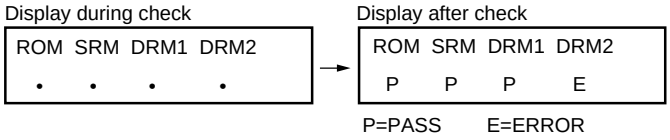
- The memory devices shown in the following table are checked.
- In case that an error occurs in the device check, the alarm buzzer shown in the table sounds.

Check device and alarm buzzer

No.	Device checked		Number of buzzer sound	Remarks
1	Main	ROM (PROGRAM FLASH)	<Short sound> 1 time	<Short sound>:
2		SRAM	<Short sounds> 2 times	0.5 sec.ON / 0.5 sec.OFF
3		D-RAM1 (*1)	<Short sounds> 3 times	<Long sounds>:
4		D-RAM2 (*2)	<Short sounds> 4 times	1.0 sec.ON / 0.5 sec.OFF
5		—	—	

*1: Work memory (SDRAM 8MB)
*2: Page memory (SDRAM 8MB)

(Example of display) In case that DRAM2 is erroneous.



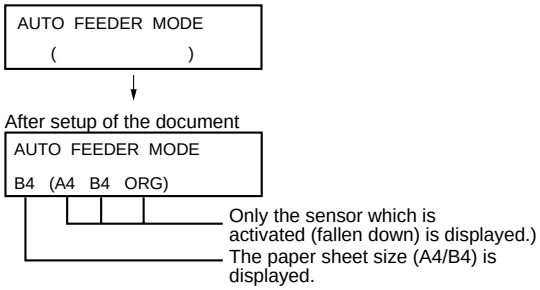
After the check is complete, the result is outputted.

D) Auto feeder mode

By executing the document insertion and discharge, the automatic feeding function can be checked. And the document sensor can be checked as well.

① Set the document

Before pressing the “START” key, only the document sensor check is carried out. And as the document sensor is ON, the document size (A4/B4) and the sensor information (A4/B4/ORG) are displayed.


AUTO FEEDER MODE
( )
After setup of the document
AUTO FEEDER MODE
B4 (A4 B4 ORG)
Only the sensor which is activated (fallen down) is displayed.)
The paper sheet size (A4/B4) is displayed.

② The automatic feeding starts by pressing the “START” key. This mode ends when the document ends, and the result is printed.

E) Aging mode

This is a mode to execute the copying action and the check pattern printing action once every 60 minutes and continue the action until 10 sheets are outputted in total.

① The printing action on the 1st sheet starts by pressing down the "START" key and entering the mode. When document is set at the time of the mode start-up the copy action is carried out, and when the document is not set the "check pattern 1" of the print dialog is printed.

② The number of printouts is displayed after printing.

F) Panel check mode

This is to check that each key acts normally and this is displayed on the LCD according to the key input. And during execution, the document reading lamp is ON. After inspection start, the LEDs light on sequentially. At the mode end with the "STOP" key, all of them go OFF. As to the test result, it is printed out after the mode end.

When the "NUMERIC" key is pressed during the panel check execution, sending of the DTMF signal corresponding to the key starts, and when another key is pressed sending of the DTMF signal stops.

- After inputting all the keys, input the "STOP" key at last, and then the result is displayed.

a) In case that all the keys are pressed.

```
PANEL CHECK MODE
ALL KEY OK !!
```

- After the mode end, the test result is printed.

b) In case that there is a key that is not pressed.

```
PANEL CHECK MODE
KEY ERROR !!
```

- At the time of NG, the keys that are not pressed are displayed sequentially, and it becomes the mode to input the key again.
- With the "STOP" key, the re-check is complete.
- After the mode end, the test result is printed.

G) Optical adjust mode

The optical system is adjusted.

- By pressing down the "START" key, the document reading lamp "100%: ON" is turned ON.

H) Product check

This is a dialog used in the production process and a mode to execute a specific mode in the series of the flow.

After the mode end, the rest result as to the checked items is printed.

- After moving to the mode, the following actions are sequentially executed.

① Memory clear (Same as Diagnosis K)

② Panel check (Same as Diagnosis F)

③ ROM & RAM test check (Same as the Diagnosis C)

④ Test result print

Memory clear printing
Panel check result printing
ROM & RAM test result printing

⑤ Print area (The specification of each item is the same as the specification of the simple mode.)

I) Signal send mode

After shift to the mode, press the START key, and the signals will be transmitted in the following sequence.
It can be used to check the modem and so on.

[1] No signals
[2] 4800BPS (V. 27ter)
[3] 14400BPS (V. 33)
[4] 12000BPS (V. 33)
[5] 14400BPS (V. 17)
[6] 12000BPS (V. 17)
[7] 9600BPS (V. 17)
[8] 7200BPS (V. 17)
[9] 9600BPS (V. 29)
[10] 7200BPS (V. 29)
[11] 4800BPS (V. 29ter)
[12] 2400BPS (V. 29ter)
[13] 300BPS (FLAG)
[14] 2100Hz (CED)
[15] 1100Hz (CNG)

J) Comm. check mode

① Turn on the Line Monitor. (SW7 No.7, SW37 No.7)

② Turn off the Cover Sheet Function. (SW2 No.6, SW32 No.6)

③ Set Line Equivalence at 0 km. (SW8 No.1/No.2, SW38 No.1/No.2)

After the check, it is necessary to be sure to return the aforementioned soft switches into the initial state.
(Clear the memory with the diagnosis.)

K) Memory clear mode

Clear the back-up memory to initialize the soft switches.
The Flash Memory will be initialized. Then, the initialized list be output.

① Memory clear is executed.

② The result that says initialized is printed.

NOTE: The life system counter is not cleared.

L) Flash Memory check

This is a mode to check that the flash memory acts normally. The flash memories shown in the following table are checked.

No.	Flash memory		Number of buzzer sound	Remarks
1		NOR-Flash (Standard)	<Long sound> 1 time	<Short sound>:
2		NAND-Flash (Standard)	<Long sounds> 2 times	0.5 sec.ON / 0.5 sec.OFF
3		NAND-Flash (Option)	<Long sounds> 3 times	<Long sounds>:
4		—	—	1.0 sec.ON / 0.5 sec.OFF
5		—	—	

- NAND-Flash (optional) is valid only when the optional memory is mounted.

① The NOR flash memory test is executed.

```
NOR FLASH CHECK
S ■■■———————— E
```

② The concerned alarm buzzer sounds only when the error occurs.

③ The NAND flash memory test is executed.

```
NAND FLASH CHECK
S ■■■———————— E
```

④ The concerned alarm buzzer sounds only when the error occurs.

⑤ The result is printed.

NOTE:
- During operation of this diagnosis, dual operation is not possible at all.
- If this is excessively repeated, it will shorten the life of the flash memory.

M) All FAX/TEL. entry mode

This is a function to copy the FAX and TEL numbers registered in the one-touch dialing (RAPID) key [01] to the all one-touch dialing (RAPID) key and the all abbreviated number (SPEED DIAL) to simplify the FAX and TEL number registration at the time of aging.

① Copy the Fax and Tel numbers (including agency) registered in the one-touch dialing (RAPID) key [01] to all one-touch dialing (RAPID) key.

② Copy the FAX and TEL numbers registered in the one-touch dialing (RAPID) key [01] to the all abbreviated number (SPEED DIAL).

③ In case the chain dial is not set in the one-touch dialing (RAPID) key [01], register the one-touch dialing (dialing) keys [02] – [59] and all abbreviated number (SPEED DIAL) to the group number [01].
In case that the chain dial is set, do not create a group, but cancel only the chain dial setting of the one-touch dialing (RAPID) key [01]. (All except for the one-touch dialing (RAPID) key [01], chain dial is kept set.)

④ Enter all registered one-touch send (RAPID) keys and speed dial numbers (SPEED DIAL) on the personal books [01] - [10].
Following this, set the password registration and the password setting to ON, and set the TTI setting to OFF.

The call-receiver names and book names are specified as follows:

Rapid	R XX	XX	: Rapid key send
SPEED DIAL	S XXX	XXX	: Speed dial number
Personal book	BOOK XX	XX	: Book number

(The letters after 16th letter of the call-receiver's name registered in the one-touch dialing [01] are cut off.)

NOTE: Before entering this mode, FAX and TEL numbers must be registered in the one-touch dialing (RAPID) key [01].
(In case that they are not registered, or a program or a group is registered, it is not executed.)

N) Dept. passcode

The department passcode list is printed.

O) Conf. passcode

The confidential passcode list is printed.
Differing from printing of one box alone soon after registration, the confidential passcodes of all boxes are printed.

P) Signal send mode 2

The signals concerned with V.34 & V.8 are checked.
After this mode is activated, press the START key, and the signals will be sent in the following sequence.
It can be used to check the modem.

[1] No signal
[2] 33600BPS (V. 34)
[3] 31200BPS (V. 34)
[4] 28800BPS (V. 34)
[5] 26400BPS (V. 34)
[6] 24000BPS (V. 34)
[7] 21600BPS (V. 34)
[8] 19200BPS (V. 34)
[9] 16800BPS (V. 34)
[10] 14400BPS (V. 34)
[11] 12000BPS (V. 34)
[12] 9600BPS (V. 34)
[13] 7200BPS (V. 34)
[14] 4800BPS (V. 34)
[15] 2400BPS (V. 34)
[16] 0 - 300BPS (V. 34)
[17] ANSam

Q) Memory set mode

The set and dump list of the memory content is output.

```
MEMORY SET MODE
AD = 00000000
```
Cursor

- The address (8 digits (P) generally including the bank information is input, and the data of 2 digits is continuously input.
  Inputting is done in the hexadecimal mode. The ten-key is used for 0 through 9, and the alphabetic keys A (RAPID 01 through 06) are used for A through F.

```
MEMORY SET MODE
AD = A02800F6  DATA = 0B
```

- During data inputting, the address can be moved forward and backward one byte by one byte with "><" and "#". (The address prior to the address 0 is looped as the maximum address.)
- The Validity of the address is not checked. Accordingly, writing/ reading operations are possible in the address of the memory not assigned, the address of ROM and so on.
  (However, as practical, writing is not done, and the data content runs short each reading.)
  Though writing is possible in the flash memory, a little time is required.
  It is also necessary to take care that the life of the flash memory is excessively shortened if much data is written in the flash memory. Since it may run away depending the written content, take minute care for the writing address.
- When the REPORT key is input, the memory dump list is produced from the displayed address (here, it is limited at the 16-byte boundary address (address with end 0) which does not exceed the specified address and is just in front.). The dump list is output to a maximum of 99 pages. If any data of one page can be repeatedly developed and printed, the list is sufficient. But it is not desired that the content of plural pages are developed in the memory once and are then printed. If the STOP key is pressed, it will pass to the diagnosis after the page which is now being printed is completed printed.
  If the address exceeds the maximum address, it will return to the address 0 and printing will be continued.

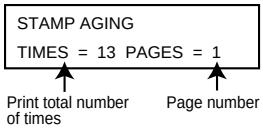
R) Stamp aging mode

This is a mode to execute the continuous drive aging of the Verification stamp.

① Set the document and press down the “START” key and the continuous drive of the Verification stamp starts.

② Send the document at the interval of 10 mm and stamp the Verification stamp continuously. The total number of times of Verification stamp printing after entering this mode is displayed on the display.

• Displayed screen during execution



③ By pressing down the “STOP” key during the action, or when no more document is left, the continuous drive of the Verification stamp stops.

NOTE:

• In case that the document is not set, this cannot be executed.

• The normal action aging that one Verification stamp is pressed on one sheet of document is executed in the normal copying.

S) Dial test mode

The mode is used to inspect whether dialing is accurate in two kinds of dial modes . All data which can be dialed in this mode are automatically called up in both PB mode and DP mode.

[In case that 2 line optional is not mounted.]

① Turn on CML, and dial the following in the PB mode.
1, 2, 3, 4, 5, 6, 7, 8, 9, ×, 0, #

② Dial the following in the DP mode.
1, 5, 9, 0

③ After dialing, turn off CML.

NOTE:

This mode uses the ordinary auto dial. (Accordingly, the signal sending time and minimum pause are all the same as ordinary.
The measurement result in this mode is completely all the same as in the ordinary dial mode.)

T) Copy diag mode

This mode is for automatic mode selection of copy to reduce the time for treatment at the time of production.

① Set 2 sheets of document. (No problem if there are 2 sheets or more.)

② 3 sheet continuous copy: 1st sheet in the FINE AUTO
2nd sheet and after that are copied in the H-TONE DARK.

NOTE:

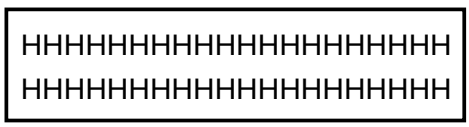
Input of the image quality and the darkness keys is invalid in this mode.

U) LCD check mode

This is an item to check that the LCD acts normally.

[In case of a 2 lines LCD]

Display “H” to all the digits. (20 letters x 2 lines)



V) Personal book list

The PASSCODE of the personal book 00 to 10 are output.

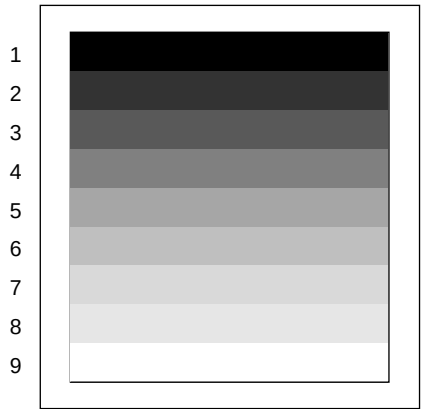
W) No function

X) No function

2-2. Print diagnosis

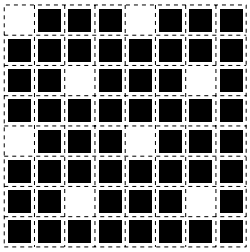
Rapid key 01: Area print mode 1

The effective printing area frame is printed in the specified sheet size.



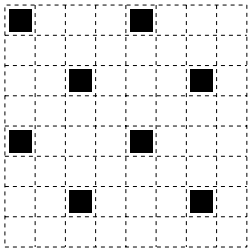
The data pattern used here are as follows and 1 data 30 mm is printed.

1. [Full black pattern]
2. [Intermediate tone 2 pattern]



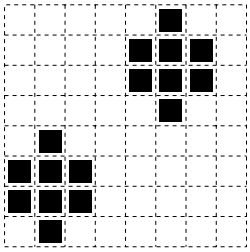
The left pattern is repeated.

3. [Intermediate tone 1 pattern]



The left pattern is repeated.

4. [Mesh point pattern]



The left pattern is repeated.

5. [Longitudinal strip 2 pattern]
   Black 2 dot and white 2 dot are repeated in line.
6. [Lateral strip 2 pattern]
   Black 2 line and white 2 line are repeated.
7. [Longitudinal strip 1 pattern]
   Black 1 dot and white 1 dot are repeated in line.
8. [Lateral strip 1 pattern]
   Black 1 line and white 1 line are repeated.
9. [Full White pattern]

Rapid key 02: Check pattern 1
The lateral stripe 2 pattern is printed on one sheet.
(Black 2 line and white 2 line are repeated.)

Rapid key 03: Check pattern 2
The lateral stripe 2 pattern is printed on multiple pages.
Press the STOP key to end the printing.

Rapid key 04: Check pattern 3
The intermediate tone 1 is printed on one sheet.

Rapid key 05: Check pattern 4
In this mode, 1 sheet is printed as to the square frame pattern for the skew measurement.

Rapid key 06: Paper feed aging 1
The mode is used for aging related to the printing. In this mode, the following modes are provided.

① Blank paper aging mode (ALL WHITE AGING)
② Whole black print aging mode (ALL BLACK AGING)
③ 5% printing aging mode (5% AGING)
④ 4% printing aging mode (4% AGING)
⑤ Outer frame check pattern
⑥ 4% check pattern

After selecting the paper-pass aging mode in the print diagnosis mode, input the number of each mode above with the ten-key, and the mode will be executed. The detailed specifications of each mode are described as follows. Here, the operation in each mode is stopped only when the STOP key is pressed by the operator or a printing-impossible error occurs.

- Blank paper aging mode
  In the mode, printing is continued in the whole white (white paper) printing pattern until the STOP key is pressed by the operator. (In the printing area)
- Whole black printing aging mode
  In the mode, printing is continued in the whole black (whole black) printing pattern until the STOP key is pressed by the operator. (In the printing area)
- 5% aging mode
  In this mode, the 5% print pattern is repeatedly printed until the [STOP] key is pressed by the operator.
- Outer frame pattern aging mode
  In this mode, the outer frame check pattern is repeatedly printed until the [STOP] key is pressed by the operator. For the outer frame, only the frame showing the printing area is printed.
- 4% chart aging mode
  In this mode, the 4% chart is repeatedly printed until the [STOP] key is pressed by the operator.

Rapid key 07: Paper feed aging 2
This is a mode that is used for aging related to printing, and there are following modes. And also as to the print interval 5 sec. – 12 hour can be set.

① Blank paper aging mode (ALL WHITE AGING)
② Whole black print aging mode (ALL BLACK AGING)
③ 5% printing aging mode (5% AGING)
④ 4% printing aging mode (4% AGING)
⑤ Outer frame check pattern aging mode
⑥ 4% check pattern aging mode

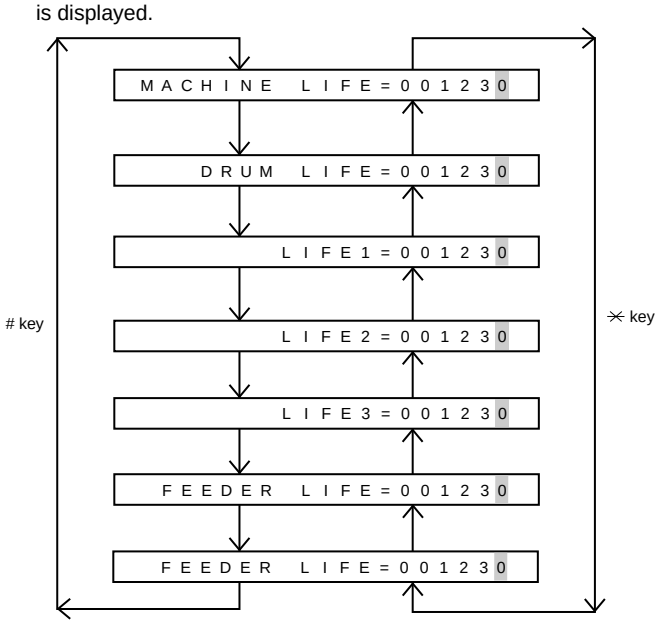
After entering this mode and selecting the paper feeding aging mode, each mode is executed by inputting the number of the above each mode with the numeric number keys and then inputting the print interval with the numeric number keys. Refer to the paper feeding aging mode 1 for each mode. Each mode stops the action only when the STOP key is pressed by an operator or when an error for print impossible occurs.

Rapid key 08: Bias adjust mode
The mode is used to adjust the printing density of the printed image. The image printing density is adjustable in seven steps of 1 to 7.
For details, refer to the following table. (For selection, use the keys 1 through 7.)

Image printing density	Thin ←					→ Thick	
	1	2	3	4	5	6	7
Default value				◎			

Rapid key 09: Life set mode
The mode is used to set the life counter of the printer and the counter of the auto feeder at desired values. For setting, proceed with the following procedure.

① When the life counter setting mode is selected, the following will be is displayed.



The cursor blinks at the top data.
Five counters can be selected with the "#" and "⋊" keys.

② In the state ①, input a desired setting number of 6 digits with the ten-key.

③ After input of 6 digits, shift to another counter with the "#" and "⋊" keys as necessary. When all necessary counters are completely input, press the START key.

④ "STORED" will be displayed with the set values stored into the memory. For checking, retry this mode.

NOTE: The counter shows the operational state of the printer (how many sheets have been printed since start of use?). The ordinary memory does not reset the counter. Accordingly, it is necessary to reset this counter in addition to the ordinary memory clear if the content in the memory on the control PWB is broken because of PWB repair, etc. (In the production stage, it is necessary to execute this in the last process.)

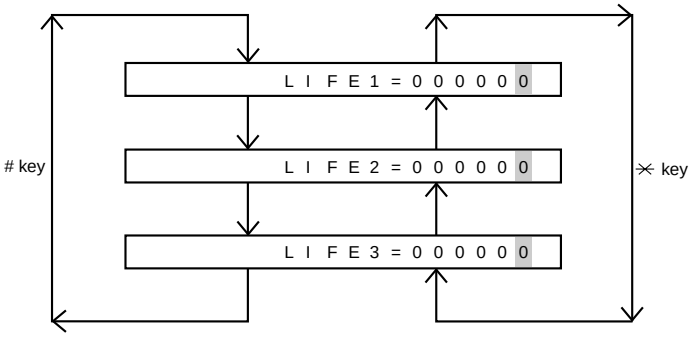
Rapid key 10: Life all clear
The mode is used to clear the life counter of the printer of the counter of the auto feeder.

NOTE: The counter shows the operational state of the printer (how many sheets have been printed since start of use?). The ordinary memory does not reset the counter. Accordingly, it is necessary to reset this counter in addition to the ordinary memory clear if the content in the memory on the control PWB is broken because of PWB repair, etc. (In the production stage, it is necessary to execute this in the last process.)

Rapid key 11: Life entry mode
(For Serviceman temporary counter)

The mode is used to set a desired value for the judgment value (alarm judgment counter value) of the general purpose life counters 1 through 3 of the printer. If the life of a consumable part (developer, imprinter, etc) is set, the model which has the error display and RMS function will inform RMS when the counter reaches the set value. For setting, proceed with the following procedure.

① When the life counter setting mode is selected, the following will be displayed.



The cursor blinks at the top data.
Three counters can be selected with the "#" and "⋇" keys.

② In the state ① , input a desired setting number of 6 digits with the ten-key.

③ After input of 6 digits, shift to another counter with the "#" and "⋇" keys as necessary. When all necessary counters are completely input, press the START key.

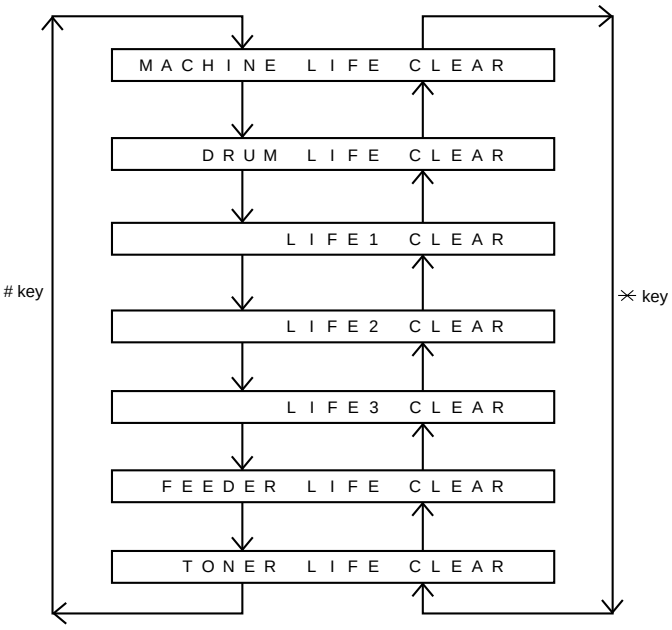
④ "STORED" will be displayed with the set values stored into the memory. For checking, retry this mode.

NOTE: The counter shows the operational state of the printer (how many sheets have been printed since start of use?). The ordinary memory does not reset the counter. Accordingly, it is necessary to reset this counter in addition to the ordinary memory clear if the content in the memory on the control PWB is broken because of PWB repair, etc. (In the production stage, it is necessary to execute this in the last process.)

Rapid key 12: Life clear mode

The mode is used to respectively clear the life counter of the printer and the counter of the auto feeder. For setting, proceed with the following procedure.

① When the life counter clearing mode is selected, the following will be is displayed.



Seven counters can be selected with the "#" and "⋇" keys.

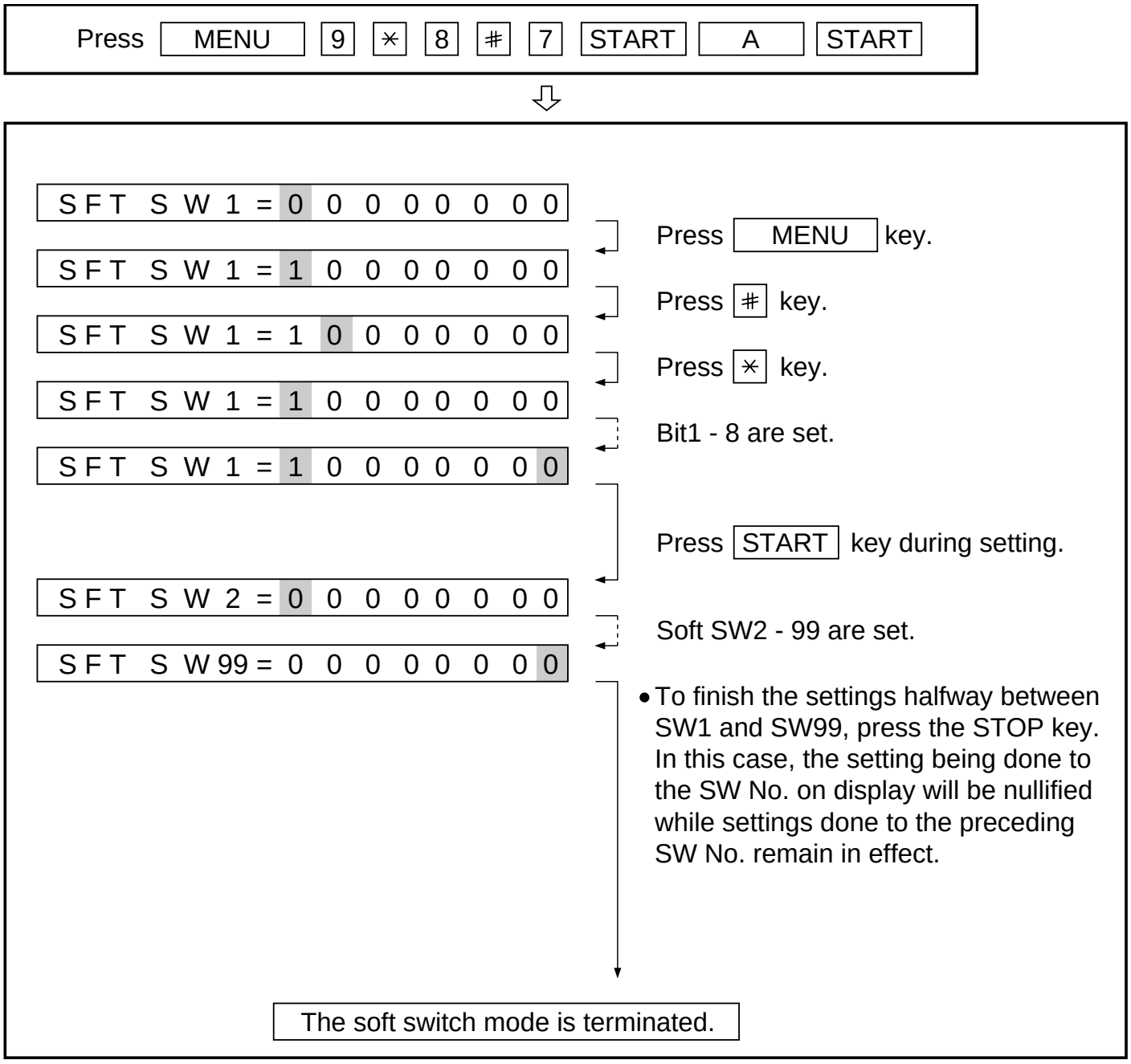
② In the state ①, input the DEL key, and the counter will be respectively cleared.

③ "CLEARED" is displayed and clearing is complete. After ending one clear, move to another counter to clear with the "#" key, "⋇" key, if necessary. After clearing the necessary counter press down the "STOP" key.

NOTE: The counter shows the operational state of the printer (how many sheets have been printed since start of use?). The ordinary memory does not reset the counter. Accordingly, it is necessary to reset this counter in addition to the ordinary memory clear if the content in the memory on the control PWB is broken because of PWB repair, etc. (In the production stage, it is necessary to execute this in the last process.)

3. How to make soft switch setting

To enter the soft switch mode, make the following key entries in sequence.


Press MENU 9 ✳ 8 # 7 START A START
SFT SW 1 = 0 0 0 0 0 0 0 0
SFT SW 1 = 1 0 0 0 0 0 0 0
SFT SW 1 = 1 0 0 0 0 0 0 0
SFT SW 1 = 1 0 0 0 0 0 0 0
SFT SW 1 = 1 0 0 0 0 0 0 0
SFT SW 2 = 0 0 0 0 0 0 0 0
SFT SW 99 = 0 0 0 0 0 0 0 0
Press MENU key.
Press # key.
Press ✳ key.
Bit1 - 8 are set.
Press START key during setting.
Soft SW2 - 99 are set.
• To finish the settings halfway between SW1 and SW99, press the STOP key. In this case, the setting being done to the SW No. on display will be nullified while settings done to the preceding SW No. remain in effect.
The soft switch mode is terminated.

4. Soft switch description

• Soft switch

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting	Remarks
			1	0		
SW1	1	Recall interval	Binary input 8 4 2 1		0	OPTION
	2		No. = 1 2 3 4 (Data No.)		1	Set to 1~15
	3		EX 0 1 0 1		0	
	4		eg. Recall interval is set to 5 min.		1	
	5	Recall times	Binary input 8 4 2 1		0	OPTION
	6		No. = 5 6 7 8 (Data No.)		0	Set to 0~14
	7		EX 0 0 1 0		1	
	8		eg. Recall times is set to 2 times.		0	
SW2	1	Dial mode	PULSE	TONE	0	
	2	Receive mode	AUTO	MANUAL	1	
	3	ECM mode	Off	On	0	OPTION
	4	Reserved			0	
	5	Polling security	On	Off	1	OPTION
	6	Auto cover sheet	No	Yes	1	OPTION
	7	JUNK-FAX function in manual reception	Yes	No	0	
	8	JUNK-FAX function	Yes	No	0	OPTION
SW3	1	Number of rings for auto-receive	Binary input 8 4 2 1		0	OPTION
	2	(0: No ring receive)	No. = 1 2 3 4 (Data No.)		0	Set to 0~9
	3		EX 0 0 0 1		0	
	4		eg. Number of rings for auto receive is set to 1 time.		1	
	5	Switch to auto-receive from manual receive	Binary input 8 4 2 1		0	OPTION
	6	(0: No switch)	No. = 5 6 7 8 (Data No.)		0	Set to 0~9
	7		EX 0 0 0 0		0	
	8		eg. Switch to auto receive is set to disable.		0	
SW4		Communication results printout				OPTION
	1		No. 1: 0 (Printed at error only) / 0 (Printed at error/timer/memory only) / 0 (Printed at transmission mode only) / 1 (Not printed) / 1 (Printed every time)		0	
	2		No. 2: 0 / 0 / 1 / 0 / 1		0	
	3		No. 3: 1 / 0 / 0 / 0 / 0		1	
	4	Image addition function to the communication result table (for memory transmission only)	On	Off	1	OPTION
	5	Reserved			0	
	6	TEL billing code function	On	Off	0	OPTION
	7	Billing code position	Before	After	1	OPTION
	8	Multi-TTI feature	On	Off	0	OPTION
SW5	1	Time display format	24 hours	12 hours-AM/PM	0	
	2	Date display format	Month-Day-Year	Day-Month-Year	1	
	3	Header print	Off	On	0	
	4	Footer print	On	Off	0	
	5	Reserved			0	
	6	Substitute reception	Off	On	0	
	7	Substitute reception conditions	Reception disable without TSI	Reception enable without TSI	0	
	8	CSI transmission	Off	On	0	

SW NO.	DATA NO.	ITEM	Switch setting and function												Initial setting	Remarks
			1										0			
	1	JBIG (Joint Bi-level Image Group)	On										Off		0	
	2	JBIG (Joint Bi-level Image Group) option	On										Off		0	
	3	MMR	On										Off		1	
	4	MR	On										Off		1	
SW6		Modem speed		V.33		V.17				V. 29		V. 27ter				
				14400	12000	14400	12000	9600	7200	9600	7200	4800	2400			
	5		No. 5	0	0	1	1	1	1	0	0	0	0		1	
	6		No. 6	1	1	0	0	0	0	0	0	0	0		0	
	7		No. 7	0	1	0	1	0	1	0	1	1	0		0	
	8		No. 8	0	0	0	0	1	1	1	1	0	0		0	
SW7		Reception speed fixed			NO	V. 17-14400bps				V. 29-9600bps		V. 27ter-4800bps				When 14400bps MODEM used, setting to 14400bps is ignored.
	1		No. 1		0	1				0		1			0	
	2		No. 2		0	1				1		0			0	
	3	DIS receive acknowledge during G3 transmission	Twice							Once in NSF reception, twice in DIS reception					0	Effective to international comm.
	4	Non-modulated carrier in V.29 transmission mode	On							Off					0	
	5	CNG send when manual TX	On							Off					1	
	6	Protocol monitor	On							Off					0	
	7	Line monitor	On							Off					0	
	8	Reserved													0	
SW8		Compromised equalizer			0Km	1.8Km				3.6Km		7.2Km				Valid when transmitting
	1		No. 1		0	0				1		1			0	
	2		No. 2		0	1				0		1			0	
	3	H2 mode	No							Yes					0	
		Signal transmission level	Binary input 16 8 4 2 1												For U.S.A	For Canada	
			No. = 4 5 6 7 8 (Data No.)														
	4		EX 0 1 1 0 1 (For U.S.A.)												0	0
	5		EX 0 1 0 0 0 (For Canada)												1	1
	6		eg. Signal transmission level is set to -10dBm												1	0
	7														0	0
	8														1	0
SW9		CED tone signal interval			75ms	500ms				750ms		1000ms				
	1		No. 1		0	0				1		1			0	
	2		No. 2		0	1				0		1			0	
	3	Equalizer freeze	On							Off					0	
	4	Equalizer freeze conditions	All							7200bps					0	
	5	CED detection time	500ms							1000ms					0	
		Alarm buzzer			3sec	1sec				No BEEP		No BEEP				
	6		No. 5		0	0				1		1			0	
	7		No. 6		0	1				0		1			0	
	8	Action when RTN received	Handle to error							Handle to no error					0	

SW NO.	DATA NO.	ITEM	Switch setting and function						Initial setting		Remarks
			1					0			
SW10	1	Memory retransmission times	Binary input 8 4 2 1						1		OPTION
	2		No. = 1 2 3 4 (Data No.)						0		
	3		EX 1 0 1 0						1		
	4		eg. Retransmission time set to 10 times.						0		
	5	Memory retransmission interval	Binary input 8 4 2 1						0		OPTION
	6		No. = 5 6 7 8 (Data No.)						0		
	7		EX 0 0 1 0						1		
	8								0		
SW11	1	V.34 mode transmission speed	Sending speed = 2400 (bps) x (N+1)						1		
	2		Example :						1		
	3		2400 (bps) x 12 = 28800 (bps)						1		
	4		2400 (bps) is set for N=0. 33600 (bps) is set for N=14.						0		
	5	V.34 mode receiving speed	Receiving speed = 2400 (bps) x (N+1)						1		
	6		Example :						1		
	7		2400 (bps) x 12 = 28800 (bps)						1		
	8		2400 (bps) is set for N=0. 33600 (bps) is set for N=14.						0		
SW12	1	V.34 mode function in case of manual communication	On			Off			1		
	2	V.34 mode function	On			Off			1		
	3	V.34 control channel communication speed	2400bps			1200bps			0		
		EOL detection timer		13sec		25sec	5sec	5sec			
	4		No. 4	0		0	1	1	0		
	5		No. 5	0		1	0	1	0		
		Processing of DIS reception after DIS transmission		Command retransmitting		A line is cut	Apply to T.30	T.30+α			
	6		No. 6	0		0	1	1	0		
	7		No. 7	0		1	0	1	0		
	8	The change to DB from DP by ✕	Yes			No			0		
SW13		DTMF output level (High)	Binary input 16 8 4 2 1						For U.S.A	For Canada	
			No. = 1 2 3 4 5 (Data No.) n x 0.5dBm								
	1		EX 0 1 1 0 0 (For U.S.A.)						0	0	
	2		EX 0 1 0 0 0 (For Canada)						1	1	
	3		eg. Signal transmission level is set to -10dBm						1	0	
	4								0	0	
	5								0	0	
	6	Reserved							0		
	7	Reserved							0		
	8	Reserved							0		
SW14		DTMF output level (Low)	Binary input 16 8 4 2 1						For U.S.A	For Canada	
			No. = 1 2 3 4 5 (Data No.) n x 0.5dBm								
	1		EX 1 0 0 0 0 (For U.S.A.)						1	0	
	2		EX 0 1 1 0 0 (For Canada)						0	1	
	3		eg. Signal transmission level is set to -10dBm						0	1	
	4								0	0	
	5								0	0	
	6	Reserved							0		
	7	Reserved							0		
	8	Reserved							0		

SW NO.	DATA NO.	ITEM	Switch setting and function								Initial setting	Remarks
			1				0					
SW15	1	Reserved									0	
	2	Reserved									0	
	3	Reserved									0	
	4	Reserved									0	
		CI Signal OFF detect enable time	(ms)	200	300	350	400	500	700	1200		
	5		No. 5	0	0	0	0	0	0	0	0	
	6		No. 6	0	0	0	0	1	1	1	1	
	7		No. 7	0	0	1	1	0	0	1	0	
	8		No. 8	0	1	0	1	0	1	0	1	
SW16	1	Reserved									0	
	2	Reserved									0	
	3	Reserved									0	
	4	Reserved									0	
		Distinctive ringing		OFF	STD	RING1	RING2	RING3	RING4	RING5		
	5		No. 5	0	0	1	0	1	0	1	0	
	6		No. 6	0	0	0	1	1	0	0	0	
	7		No. 7	0	0	0	0	0	1	1	0	
	8		No. 8	0	1	0	0	0	0	0	0	
SW17	1	Reserved									0	
	2	Reserved									0	
	3	Reserved									0	
	4	Reserved									0	
	5	Reserved									0	
	6	Reserved									0	
	7	Reserved									0	
	8	Reserved									1	
SW18	1	Reserved									1	
	2	Reserved									0	
	3	Reserved									0	
	4	Reserved									0	
	5	Reserved									1	
	6	Reserved									1	
	7	Reserved									0	
	8	Reserved									0	
SW19	1	Reserved									1	
	2	Reserved									0	
	3	Reserved									0	
	4	Reserved									0	
	5	Reserved									1	
	6	Reserved									0	
	7	Reserved									0	
	8	Reserved									0	
SW20	1	Reserved									0	
	2	Reserved									0	
	3	Reserved									0	
	4	Reserved									0	
	5	Reserved									0	
	6	Reserved									0	
	7	Reserved									0	
	8	Reserved									0	

SW NO.	DATA NO.	ITEM	Switch setting and function						Initial setting	Remarks
			1			0				
	1	Reserved							0	
	2	Reserved							0	
	3	Reserved							0	
		Busy tone detection frequency		520~640Hz	300~600Hz	380~500Hz	Reserve	Reserve		
SW21	4		No. 4	0	0	0	0	1	0	
	5		No. 5	0	0	1	1	0	0	
	6		No. 6	0	1	0	1	0	0	
	7	Reserved							0	
	8	Reserved							0	
	1	Reserved							0	
	2	Reserved							0	
	3	Reserved							0	
SW22	4	Reserved							0	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							0	
	8	Reserved							0	
	1	Reserved							0	
	2	Reserved							1	
	3	Reserved							0	
SW23	4	Reserved							1	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							1	
	8	Reserved							0	
	1	Reserved							0	
	2	Reserved							1	
	3	Reserved							0	
SW24	4	Reserved							0	
	5	Reserved							1	
	6	Reserved							1	
	7	Reserved							0	
	8	Reserved							0	
	1	Reserved							0	
	2	Reserved							0	
	3	Reserved							0	
SW25	4	Reserved							1	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							0	
	8	Reserved							0	
	1	Reserved							0	
	2	Reserved							0	
	3	Reserved							1	
SW26	4	Reserved							1	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							1	
	8	Reserved							0	
	1	Reserved							0	
	2	Reserved							1	
	3	Reserved							0	
SW27	4	Reserved							0	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							0	
	8	Reserved							0	

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting		Remarks
			1	0			
SW28	1	Reserved			0		
	2	Reserved			0		
	3	Reserved			1		
	4	Reserved			1		
	5	Reserved			1		
	6	Reserved			0		
	7	Reserved			0		
	8	Reserved			0		
SW29	1	Reserved			0		
	2	Reserved			0		
	3	Reserved			0		
	4	Reserved			0		
	5	Reserved			1		
	6	Reserved			0		
	7	Reserved			0		
	8	Reserved			0		
SW30	1	Reserved			0		
	2	Reserved			0		
	3	Reserved			0		
					For U.S.A.	For Canada	
	4	Reserved			0	0	
	5	Reserved			1	1	
	6	Reserved			1	0	
	7	Reserved			0	0	
	8	Reserved			1	0	
SW31	1	Reserved			0		
	2	Reserved			0		
	3	Reserved			0		
	4	Reserved			0		
	5	Reserved			0		
	6	Reserved			0		
	7	Reserved			0		
	8	Reserved			0		
SW32	1	Reserved			1		
	2	Reserved			0		
	3	Reserved			1		
	4	Reserved			0		
	5	Reserved			0		
	6	Reserved			0		
	7	Reserved			1		
	8	Reserved			0		
SW33	1	Reserved			1		
	2	Reserved			1		
	3	Reserved			1		
	4	Reserved			0		
	5	Reserved			1		
	6	Reserved			1		
	7	Reserved			1		
	8	Reserved			0		

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting		Remarks
			1	0			
SW34	1	Reserved			1		
	2	Reserved			1		
	3	Reserved			0		
	4	Reserved			0		
	5	Reserved			0		
	6	Reserved			0		
	7	Reserved			0		
	8	Reserved			0		
SW35					For U.S.A.	For Canada	
	1	Reserved			0	0	
	2	Reserved			1	1	
	3	Reserved			1	0	
	4	Reserved			0	0	
	5	Reserved			0	0	
	6	Reserved			0		
	7	Reserved			0		
	8	Reserved			0		
SW36					For U.S.A.	For Canada	
	1	Reserved			1	0	
	2	Reserved			0	1	
	3	Reserved			0	1	
	4	Reserved			0	0	
	5	Reserved			0	0	
	6	Reserved			0		
	7	Reserved			0		
	8	Reserved			0		
SW37	1	Reserved			0		
	2	Reserved			0		
	3	Reserved			0		
	4	Reserved			0		
	5	Reserved			0		
	6	Reserved			1		
	7	Reserved			0		
	8	Reserved			1		
SW38	1	Reserved			0		
	2	Reserved			0		
	3	Reserved			0		
	4	Reserved			0		
	5	Reserved			0		
	6	Reserved			0		
	7	Reserved			0		
	8	Reserved			0		
SW39	1	Reserved			0		
	2	Reserved			0		
	3	Reserved			0		
	4	Reserved			0		
	5	Reserved			0		
	6	Reserved			0		
	7	Reserved			0		
	8	Reserved			1		

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting	Remarks
			1	0		
SW40	1	Reserved			1	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			1	
	6	Reserved			1	
	7	Reserved			0	
	8	Reserved			0	
SW41	1	Reserved			1	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			1	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW42	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW43	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW44	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW45	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting	Remarks
			1	0		
SW46	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW47	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW48	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW49	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW50	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW51	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting	Remarks
			1	0		
SW52	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW53	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW54	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW55	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW56	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW57	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting	Remarks
			1		0				
SW58	1	Reserved						0	
	2	Reserved						0	
	3	Reserved						0	
	4	Reserved						0	
	5	Reserved						0	
	6	Reserved						0	
	7	Reserved						0	
	8	Reserved						0	
SW59	1	Reserved						0	
	2	Reserved						0	
	3	Reserved						0	
	4	Reserved						0	
	5	Reserved						0	
	6	Reserved						0	
	7	Reserved						0	
	8	Reserved						0	
SW60	1	Reserved						0	
	2	Reserved						0	
	3	Reserved						0	
	4	Reserved						0	
	5	Reserved						0	
	6	Reserved						0	
	7	Reserved						0	
	8	Reserved						0	
SW61	1	F.A.S.T. (RMS) mode	On		Off			0	
	2	Reserved						0	
	3	Verification stamp	Yes		No			0	
	4	Day light saving	No		Yes			1	
		Key buzzer volume		Off	High	Low	Low		
	5		No. 5	0	0	1	1	1	
	6		No. 6	0	1	0	1	0	
	7	Reserved						0	
	8	Reserved						0	
SW62				High	High	Middle	Low		
	1	Speaker volume	No. 1	0	0	1	1	1	
	2		No. 2	0	1	0	1	1	
	3	Reserved						1	
	4	Reserved						0	
				Off	High	Middle	Low		
	5	Ringer volume	No. 5	0	0	1	1	1	
	6		No. 6	0	1	0	1	1	
	7	Reserved						0	
	8	Reserved						0	
SW63	1	Reserved						0	
	2	Reserved						1	
	3	Reserved						0	
	4	Reserved						0	
	5	Reserved						1	
	6	Reserved						0	
	7	Reserved						1	
	8	Reserved						0	

SW NO.	DATA NO.	ITEM	Switch setting and function						Initial setting	Remarks
			1			0				
	1	Header registration	On			Off			0	
	2	Reserved							0	
	3	Continuous serial polling	On			Off			0	
SW64		Time interval for continuous serial polling								OPTION
				0 min.		30 min.	60 min.	120 min.		When SW64 -No.3
	4		No. 4	0		0	1	1	0	is on, option setting
	5		No. 5	0		1	0	1	0	can be set up
	6	Reserved							0	
	7	Reserved							0	
	8	Quick on line function	Yes			No			1	
		Cassette selection		Manual		Auto-1	Auto-2	Auto-1		OPTION
	1		No. 1	0		0	1	1	0	
	2		No. 2	0		1	0	1	1	
		The 1st priority cassette		None	Tray	1st Cass.	2nd Cass.	Tray		OPTION
	3		No. 3	0	0	0	0	Other	0	It is effective
SW65	4		No. 4	0	0	1	1	Combination	1	only when
	5		No. 5	0	1	0	1		0	No.31-1/2 are
		The 2nd priority cassette		None	Tray	1st Cass.	2nd Cass.	Tray		OPTION
	6		No. 6	0	0	0	0	Other	0	It is effective
	7		No. 7	0	0	1	1	Combination	1	only when
	8		No. 8	0	1	0	1		1	No.31-1/2 are
		The 3rd priority cassette		None	Tray	1st Cass.	2nd Cass.	Tray		OPTION
	1		No. 1	0	0	0	0	Other	0	It is effective
	2		No. 2	0	0	1	1	Combination	0	only when
	3		No. 3	0	1	0	1		1	No.31-1/2 are
SW66		Cassette selection of separate page		None	Tray	1st Cass.	2nd Cass.			OPTION
	4		No. 4	0	0	1	1		0	
	5		No. 5	0	1	0	1		1	
	6	Reserved							0	
	7	Reserved							0	
	8	Reserved							0	
		Power save mode		OFF		ON				OPTION
	1		No.1	0		0			0	
	2		No.2	0		1			0	
		Density adjustment of print bias	Binary input 4 2 1							set to 1~7.
	3		No. = 3 4 5 (Data No.) 1: faint 6: deep						1	set to 0, is
SW67	4		EX 1 0 0						0	equal to 4
	5		eg. Bias is set to level 4.						0	(100)
		Drum life detection		No Detection	Over only	Near and Over	Near and Over			
	6		No. 6	0	0	1	1		1	
	7		No. 7	0	1	0	1		1	
	8	Reserved							0	
		Distinctive ring pattern		U.S.A.	Canada	Australia	Hong Kong		For U.S.A.	For Canada	
	1		No. 1	0	0	1	1		0	0	
	2		No. 2	0	1	0	1		0	1	
SW68	3	Reserved							0		
	4	Reserved							1		
	5	Reserved							0		
	6	Reserved							0		
	7	Reserved							1		
	8	Reserved							0		

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting	Remarks
			1				0		
SW69	1	Reserved						1	
	2	Reserved						0	
	3	Reserved						0	
	4	Reserved						1	
	5	Reserved						0	
	6	Reserved						1	
	7	Reserved						1	
	8	Reserved						0	
SW70	1	Reserved						1	
	2	Reserved						0	
	3	Reserved						1	
	4	Reserved						0	
	5	Reserved						0	
	6	Reserved						0	
	7	Reserved						0	
	8	Reserved						1	
SW71		The default resolution for copying		Standard	Fine	S-Fine	U-Fine		OPTION
	1		No. 1	0	0	1	1	0	
	2		No. 2	0	1	0	1	1	
	3	Reserved						0	
	4	Reserved						1	
	5	Reserved						0	
		Picture quality priority mode		Standard	Fine	S-Fine	U-Fine		OPTION
	6		No. 6	0	0	1	1	0	
	7		No. 7	0	1	0	1	0	
	8	Reserved						0	
SW72	1	Reserved						1	
	2	Reserved						0	
	3	Reserved						1	
	4	Reserved						0	
	5	Reserved						0	
	6	Reserved						0	
	7	Reserved						0	
	8	Reserved						0	
SW73	1	Reserved						0	
	2	Reserved						0	
	3	Reserved						0	
	4	Reserved						0	
	5	Reserved						0	
		Data reduction		AUTO	100%				The number in ( ) is
	6	(Except notation: Setting prohibition)	No. 6	0	1	Set up to 100% except the		0	applicable for the
	7		No. 7	0	0	notation		0	footer print on. Auto
	8		No. 8	0	0			0	is equivalent to 100%.
SW74	1	Automatic printing of activity report	Yes (When memory full)			No (First data is cleared when memory full)		0	OPTION
	2	Print out of total time and total number of pages on activity report	Off			On		0	
	3	Reserved						0	
	4	Department function	On			Off		0	
	5	Department ID digit	Binary input 8 4 2 1					0	OPTION
	6		No. = 5 6 7 8 (Data No.)					1	set to 3~9
	7		EX 0 1 0 0					0	
	8		eg. Department ID is set to 4 digits					0	

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting	Remarks
			1			0			
SW75	1	Copy protect switch	On			Off		0	
	2	Cut-off mode (when copy mode)	Continue			Cut-off		0	OPTION
	3	Scanning ratio in memory input	1 : 1			Reduce		0	Memory scanning
	4	Overseas communication mode selection function	Yes			No		0	
	5	Reserved						0	
		Reduce ratio when copy mode		AUTO	100%				
	6	(Except notation: Setting prohibition)	No. 6	0	1	Set up to 100% except the notation		1	
	7		No. 7	0	0			0	
	8		No. 8	0	0			0	
SW76	1	Reserved						0	
	2	Reserved						0	
		Density adjustment (when Fine/STD mode)		Normal	Faint	Deep	Deep (when Dark mode)		
	3		No. 3	0	0	1	1	0	
	4		No. 4	0	1	0	1	0	
		Density adjustment (when Half-tone mode)		Normal	Faint	Deep	Deep (when Dark mode)		
	5		No. 5	0	0	1	1	0	
	6		No. 6	0	1	0	1	0	
	7	MTF correction in half-tone mode	On			Off		1	
	8	MTF intensity in half-tone mode	Strong			Weak		0	
SW77	1	Cassette define LTR/A4: Tray	A4			LTR		0	
	2	Cassette define LTR/A4: Upper	A4			LTR		0	When W cassette
	3	Cassette define LTR/A4: Lower	A4			LTR		0	Ignore when W cassette
	4	Reserved						1	
	5	Reserved						1	
	6	Reserved						0	
	7	Reserved						0	
	8	Reserved						0	
SW78	1	Reserved						1	
	2	Reserved						0	
	3	Reserved						0	
	4	Reserved						0	
	5	Reserved						0	
	6	Reserved						0	
	7	Reserved						0	
	8	Reserved						0	
SW79	1	Secure billing code	Yes			No		0	
	2	Pause with SHIFT key	Yes			No		0	Only when special billing code is given.
	3	Reserved						0	
	4	Z key pause time	Binary input 16 8 4 2 1					0	Only when the special billing code is given. The ordinary pause is not affected.
	5	(250ms unit)	No. = 4 5 6 7 8 (Data No.)					0	
	6		EX 0 0 0 0 0					0	
	7		eg. Pause time 250ms					0	
	8		Time=(n+1) x 250ms					0	
SW80	1	Separate feature	On			Off		0	
	2	Reserved						0	
	3	Reserved						0	
	4	Reserved						0	
	5	Addition of header (Sender information)	On			Off		1	
	6	DTMF sending by the panel test	On			Off		0	
	7	Power save mode	Real time			Timer		1	
	8	Reserved						0	

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting	Remarks
			1	0		
SW81	1	Reserved			1	
	2	Reserved			0	
	3	Reserved			1	
	4	Reserved			1	
	5	Reserved			1	
	6	Reserved			1	
	7	Reserved			1	
	8	Reserved			1	
SW82	1	Reserved			0	
	2	Reserved			1	
	3	Reserved			0	
	4	Reserved			1	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW83	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			1	
	7	Reserved			0	
	8	Reserved			1	
SW84	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW85	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			1	
	6	Reserved			0	
	7	Reserved			1	
	8	Reserved			0	
SW86	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting	Remarks
			1	0		
SW87	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW88	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW89	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			1	
SW90	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			1	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			1	
	7	Reserved			0	
	8	Reserved			1	
SW91	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW92	1	Reserved			0	
	2	Reserved			1	
	3	Waiting time after dialing	90sec	The specification of each country is followed	0	
	4	Show receiver's name	Yes (Show)	No (Hide)	1	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW93	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	

SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting	Remarks
			1	0		
SW94	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW95	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			1	
	6	Reserved			1	
	7	Reserved			0	
	8	Reserved			1	
SW96	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW97	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW98	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW99	1	Reserved			0	
					For U.S.A. / For Canada	
	2	Reserved			1 / 0	
					For U.S.A. / For Canada	
	3	Reserved			1 / 0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			1	
	8	Reserved			1	

• Soft switch function description

SW1 No. 1 ~ No. 4 Recall interval
Choice is made for a recall interval for speed and rapid dial numbers. Use a binary number to program this. If set to 0 accidentally, 1 will be assumed.

SW1 No. 5 ~ No. 8 Recall times
Choice is made as to how many recall times should be made. Use a binary number to program this.

SW2 No. 1 Dial mode
Switch the type according to the telephone circuit connected to the facsimile.

0: PULSE DIAL

1: TONE DIAL

SW2 No. 2 Receive mode
Auto/manual receiving mode is set.

SW2 No. 3 ECM mode
Used to determine ECM mode function.

SW2 No. 4 Reserved
Set to "0".

SW2 No. 5 Polling security
This switch is employed to enable or disable the polling operation using the ID code verification function, in order to prevent unauthorized polling operation.

SW2 No. 6 Auto cover sheet
When "1" (=YES) is selected, the cover sheet is automatically sent after transmission of the original to notify the receiver of the number of original sheets transmitted.

SW2 No. 7 JUNK-FAX function in manual reception
It is set whether JUNK-FAX is functioned in the manual receiving mode or not.

SW2 No. 8 JUNK-FAX function
This function is used to receive data from a specific remote machine (station registered in entry mode). It is the function that refused a reception in the case that TSI of remote machine matched with fax number of the station registered.

0: No

1: Yes

SW3 No. 1 ~ No. 4 Number of rings for auto-receive (0: No ring receive)
When the machine is set in the auto receive mode, the number of rings before answering can be selected. It may be set from one to nine rings using a binary number. If the soft switch was set to 1, a direct connection is made to the facsimile. If it was set to 0 accidentally, receive ring is set to 1. If it was above 9, receive rings are set to 9.

SW3 No. 5 ~ No. 8 Switch to auto-receive from manual receive (0: No switch)

This setting allows machine to switch from manual to Auto Receive mode. Setting this number to 0 forces machine to stay in Manual receive mode. Entering the binary number 0 forces the machine to remain in the manual answer mode. If a number between 1 and 9 is entered, the machine will go into the answer mode after the given number of rings. However, it can be used as an ordinary telephone if the handset is taken off the hook before this programmed number is finished. If entry of a number above 9 by accident, it will be set to 9. In this case, it must be corrected to the proper number.

SW4 No. 1 ~ No. 3 Communication results printout
It is possible to obtain communication results after each transaction. Normally, the switch is set (No. 1: 0, No. 2: 0, No. 3: 1) so that the communication result is produced only a communication error is encountered. If No. 1 was set to 1, No. 2 was set to 1 and No. 3 was set to 0, the communication result will be produced every time a communication is done, even if the communication was successful.

If No. 1 was set to 0, No. 2 to 1 and No. 3 to 0, the communication result will be produced every transmission.

Setting No. 1 to 1 No. 2 to 0 and No. 3 to 0 will disable this function. No transaction report will be printed.

If No. 1 was set to 0, No. 2 to 0 and No. 3 to 0, the communication result is produced only after a timer and memory transmission or when a communication error is encountered.

SW4 No. 4 Image addition function to the communication result table (for memory transmission only)
Used to set addition of sending image to the communication result table.

SW4 No. 5 Reserved
Set to "0".

SW4 No. 6 TEL billing code function
When set to "1", the TEL billing code function is enabled.

SW4 No. 7 Billing code position
When set to "1", the billing code is delivered before dialing the remote number. When set to "0", the billing code is delivered after dialing.

SW4 No. 8 Multi-TTI feature
When this switch is set to "1", Multi TTI function is enabled.

SW5 No. 1 Time display format
When this switch is set to "0", time is displayed in 12-hour system.

When set to "1", 24-hour system.

SW5 No. 2 Date display format
Used to select date display/print formats.

0: DAY-Month-Year

1: Month-DAY-Year

SW5 No. 3 Header print
When it is set at 0, sender's name, sending page number and so on are automatically printed in the recording paper on the receiving side during transmission. Thus, the sender can be known on the receiving side.

0: Applied.

1: Not applied.

SW5 No. 4 Footer print
When set to "1", the date of reception, the sender machine No., and the page No. are automatically recorded at the end of reception.

SW5 No. 5 Reserved
Set to "0".

SW5 No. 6 Substitute reception
Selection of substitute reception in the case of recording paper ex-hausted or paper jam. If set to "NO", auto receive is disabled even when the receive memory is ready to receive.

Substitute reception is not performed even during receive operation.

SW5 No. 7 Substitute reception conditions
Selection of substitute reception according to existence of TEL number from transmitting side. Initial setting allows substitute reception without CSI. If set to "no", the receiver cannot receive any documents

SW5 No. 8 CSI transmission
CSI signal contains the sender's phone number registered in the machine. If this switch is set to "1", no sender's name will be printed at the receiving side.

SW6 No. 1 JBIG (Joint Bi-level Image Group)
An image compression encoding method recommended by ITU-T. It realizes 2-second transmission when the power is turned on.

SW6 No. 2 JBIG (Joint Bi-level Image Group) option
An optional function for JBIG.

SW6 No. 3 MMR
MMR (Modified MR) selects presence of the compression function.

SW6 No. 4 MR
MR (Modified READ) selects presence of the compression function.

SW6 No. 5 ~ No. 8 Modem speed
Used to determine the initial modem speed. The default is 14400BPS(V.17). It may be necessary to program it to a slower speed when frequent line fallback is encountered, in order to save the time required for the fallback procedure.

SW7 No. 1, No. 2 Reception speed fixed
The transferable speed of modem in the receiving mode is set.

SW7 No. 3 DIS receive acknowledge during G3 transmission
Used to make a choice of whether reception of NSF (DIS) is acknowledged after receiving two NSFs (DISs) or receiving one NSF (two DISs).

It may be useful for overseas communication to avoid an echo suppression problem, if set to 1.

SW7 No. 4 Non-modulated carrier in V.29 transmission mode
Though transmission of a non-modulated carrier is not required for transmission by the V29 modem according to the CCITT Recommendation, it may be permitted to send a non-modulated carrier before the image signal to avoid an echo suppression problem. It may be useful for overseas communication to avoid an echo suppression problem, if set to 1.

SW7 No. 5 CNG send when manual TX
CNG signal sending ON/OFF in case of manual transmission is set.

SW7 No. 6 Protocol monitor
Normally set to "0". If set to "1", communication can be checked, in case of troubles, without using a G3 tester or other tools.

When communication FSK data transmission or reception is made, the data is taken into buffer. When communication is finished, the data analyzed and printed out. When data is received with the line monitor (SW7-No. 7) set to "1" the reception level is also printed out.

SW7 No. 7 Line monitor
Normally set to "0". If set to "1", the transmission speed and the reception level are displayed on the LCD. Used for line tests.

SW7 No. 8 Reserved
Set to "0".

SW8 No. 1, No. 2 Compromised equalizer
The specific line equalizer is inserted.

No. 1	No. 2	
0	0	The line equalizer built in the modem is turned off.
0	1	Line equalizer corresponding to 1.8 km
1	0	Line equalizer corresponding to 3.6 km
0	1	Line equalizer corresponding to 7.2 km

SW8 No. 3 H2 mode
Used to determine H2 mode (15sec transmission mode). When set to OFF, H2 mode is inhibited even though the transmitting machine has H2 mode.

SW8 No. 4 ~ No. 8 Signal transmission level
Used to control the signal transmission level in the range of –0dB to –31dB.

SW9 No. 1, No. 2 CED tone signal interval
For international communication, the 2100Hz CED tone may act as an echo suppresser switch, causing a communication problem. Though this soft switch is normally set to "0", it should be set to "1" so as to change the time between CED tone and DIS signal from 75ms to 500ms to eliminate the communication problem caused by echo.

SW9 No. 3 Equalizer freeze
This switch is used to perform reception operation by fixing the equalizer control of modem for the line which is always in an unfavorable state and picture cannot be received. Usually, the control is executed according to the state of line where the equalizer setting is changed always.

SW9 No. 4 Equalizer freeze conditions
Setting which specifies SW9 No.3 control only in condition of 7200bps modem speed.

SW9 No. 5 CED detection time
The detection time of the CED signal from the called side in the auto calling mode is set.

SW9 No. 6, No. 7 Alarm buzzer
The length of the buzzer for normal end of operation is set.

SW9 No. 8 Action when RTN received
The operation is set when the RTN signal is received in the G3 transmission mode.

SW10 No. 1 ~ No. 4 Memory retransmission times
The number of memory retransmissions is set.

SW10 No. 5 ~ No. 8 Memory retransmission interval
The interval between memory retransmissions is set.

SW11 No. 1 ~ No. 4 V.34 mode transmission speed
Used to determine the initial modem speed when communication method is V.34 transmission mode.

SW11 No. 5 ~ No. 8 V.34 mode receiving speed
Used to determine the initial modem speed when communication method is V.34 reception mode.

SW12 No. 1 V.34 mode function in case of manual communication
Used to select whether the V.34 mode is made valid when automatically transmitting/receiving.

SW12 No. 2 V.34 mode function
Used to select the V.34 mode for communication when set to “1”, communication method is V.34 mode..

SW12 No. 3 V.34 control channel communication speed
Used to select the control channel communication speed for V.34 mode.

SW12 No. 4, No. 5 EOL detection timer
Used to make a choice of whether to use the 25-second or 13-second timer for detection of End of line This is effective to override communication failures with some facsimile models that have longer End of line detection.

SW12 No. 6, No. 7 Processing of DIS reception after DIS transmission
When receiving , operation in case of DIS reception after DIS transmission is selected. Retransmitting command: To retransmit DIS in disregard of DIS reception.
Breaking circuit: To break circuit instantly. (Abnormal finish)
T. 30: To operate in accordance with T.30.
T. 30+α: To operate in accordance with T.30+α. (To operate differently according to cases.)

SW12 No. 8 The change to DB from DP by ✳
When setting to 1, the mode is changed by pressing the ✳ key from the pulse dial mode to the tone dial mode.

SW13 No. 1 ~ No. 5 DTMF output level (High)
To set the level to output high group DTMF signals. –15 to 0 dBm (0.5 dBm unit)

SW13 No. 6 ~ No. 8 Reserved
Set to "0".

SW14 No. 1 ~ No. 5 DTMF output level (Low)
To set the level to output low group DTMF signals. –15 to 0 dBm (0.5 dBm unit)

SW14 No. 6 ~ No. 8 Reserved
Set to "0".

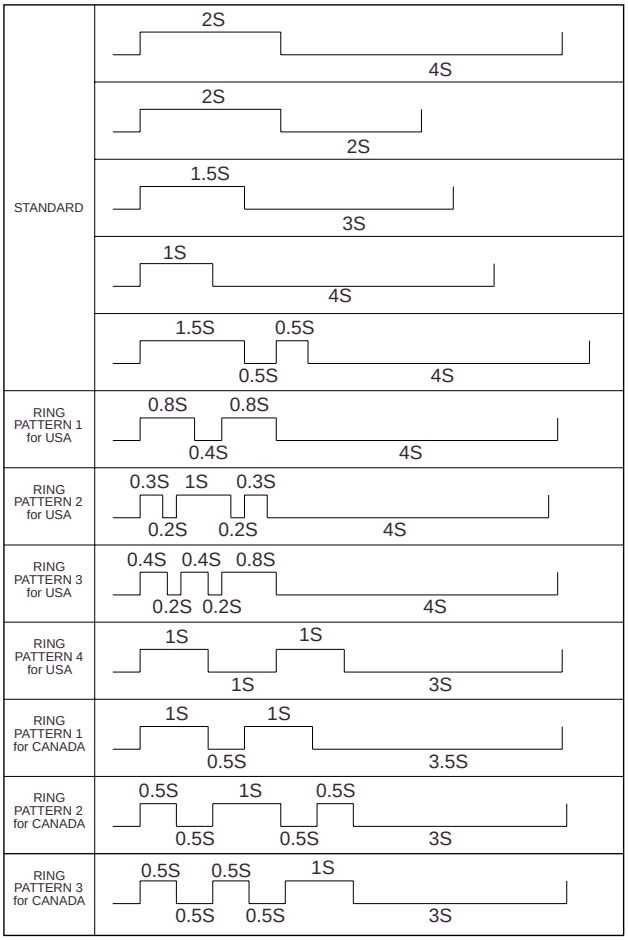
SW15 No. 1 ~ No. 4 Reserved
Set to "0".

SW15 No. 5 ~ No. 8 CI signal OFF detect enable time
Used to set the continuous detection time during OFF period of CI signal.

SW16 No. 1 ~ No. 4 Reserved
Set to "0".

SW16 No. 5 ~ No. 8 Distinctive ringing
When the ringing setting is turned off, all of the CI signal are received. When any of the standard, and ring patterns 1 through 3 is selected for the ringing setting, only the selected CI signal is received.

CI signal patterns
The CI signal patterns consists of the standard pattern, and ring patterns 1 through 7. The standard pattern is the conventional one.



SW17 No. 1 ~ No. 7 Reserved
Set to "0".

SW17 No. 8 Reserved
Set to "1".

SW18 No. 1 Reserved
Set to "1".

SW18 No. 2 ~ No. 4 Reserved
Set to "0".

SW18 No. 5 , No. 6 Reserved
Set to "1".

SW18 No. 7 , No. 8 Reserved
Set to "0".

SW19 No. 1 Reserved
Set to "1".

SW19 No. 2 ~ No. 4 Reserved
Set to "0".

SW19 No. 5 Reserved
Set to "1".

SW19 No. 6 ~ No. 8 Reserved
Set to "0".

SW20 No. 1 ~ No. 8 Reserved
Set to "0".

SW21 No. 1 ~ No. 3 Reserved
Set to "0".

SW21 No. 4 ~ No. 6 Busy tone detection frequency
To select frequency range of signals to be detected as Busy Tone.

SW21 No. 7, No. 8 Reserved
Set to "0".

SW22 No. 1 ~ No. 8 Reserved
Set to "0".

SW23 No. 1 Reserved
Set to "0".

SW23 No. 2 Reserved
Set to "1".

SW23 No. 3 Reserved
Set to "0".

SW23 No. 4 Reserved
Set to "1".

SW23 No. 5, No. 6 Reserved
Set to "0".

SW23 No. 7 Reserved
Set to "1".

SW23 No. 8 Reserved
Set to "0".

SW24 No. 1 Reserved
Set to "0".

SW24 No. 2 Reserved
Set to "1".

SW24 No. 3, No. 4 Reserved
Set to "0".

SW24 No. 5, No. 6 Reserved
Set to "1".

SW24 No. 7, No. 8 Reserved
Set to "0".

SW25 No. 1 ~ No. 3 Reserved
Set to "0".

SW25 No. 4 Reserved
Set to "1".

SW25 No. 5 ~ No. 8 Reserved
Set to "0".

SW26 No. 1, No. 2 Reserved
Set to "0".

SW26 No. 3, No. 4 Reserved
Set to "1".

SW26 No. 5, No. 6 Reserved
Set to "0".

SW26 No. 7 Reserved
Set to "1".

SW26 No. 8 Reserved
Set to "0".

SW27 No. 1 Reserved
Set to "0".

SW27 No. 2 Reserved
Set to "1".

SW27 No. 3 ~ No. 8 Reserved
Set to "0".

SW28 No. 1, No. 2 Reserved
Set to "0".

SW28 No. 3 ~ No. 5 Reserved
Set to "1".

SW28 No. 6 ~ No. 8 Reserved
Set to "0".

SW29 No. 1 ~ No. 4 Reserved
Set to "0".

SW29 No. 5 Reserved
Set to "1".

SW29 No. 6 ~ No. 8 Reserved
Set to "0".

SW30 No. 1 ~ No. 4 Reserved
Set to "0".

SW30 No. 5 Reserved (For U.S.A.)
Set to "1".

SW30 No. 6 Reserved (For U.S.A.)
Set to "1".

SW30 No. 6 Reserved (For Canada)
Set to "0".

SW30 No. 7 Reserved
Set to "0".

SW30 No. 8 Reserved (For U.S.A.)
Set to "1".

SW30 No. 8 Reserved (For Canada)
Set to "0".

SW31 No. 1 ~ No. 8 Reserved
Set to "0".

SW32 No. 1 Reserved
Set to "1".

SW32 No. 2 Reserved
Set to "0".

SW32 No. 3 Reserved
Set to "1".

SW32 No. 4 ~ No. 6 Reserved
Set to "0".

SW32 No. 7 Reserved
Set to "1".

SW32 No. 8 Reserved
Set to "0".

SW33 No. 1 ~ No. 3 Reserved
Set to "1".

SW33 No. 4 Reserved
Set to "0".

SW33 No. 5 ~ No. 7 Reserved
Set to "1".

SW33 No. 8 Reserved
Set to "0".

SW34 No. 1, No. 2 Reserved
Set to "1".

SW34 No. 3 ~ No. 8 Reserved
Set to "0".

SW35 No. 1 Reserved
Set to "0".

SW35 No. 2 Reserved
Set to "1".

SW35 No. 3 Reserved (For U.S.A.)
Set to "1".

SW35 No. 3 Reserved (For Canada)
Set to "0".

SW35 No. 4 ~ No. 8 Reserved
Set to "0".

SW36 No. 1 Reserved (For U.S.A.)
Set to "1".

SW36 No. 1 Reserved (For Canada)
Set to "0".

SW36 No. 2 Reserved (For U.S.A.)
Set to "0".

SW36 No. 2 Reserved (For Canada)
Set to "1".

SW36 No. 3 Reserved (For U.S.A.)
Set to "0".

SW36 No. 3 Reserved (For Canada)
Set to "1".

SW36 No. 4 ~ No. 8 Reserved
Set to "0".

SW37 No. 1 ~ No. 5 Reserved
Set to "0".

SW37 No. 6 Reserved
Set to "1".

SW37 No. 7 Reserved
Set to "0".

SW37 No. 8 Reserved
Set to "1".

SW37 No. 5 ~ No. 8 CI signal off detect enable time
Used to set the continuous detection time during OFF period of CI signal. Normally set to 700ms, where the short ring (500ms: OFF period) cannot be detected. Therefore, selection of 350ms is allowed.

SW38 No. 1 ~ No. 8 Reserved
Set to "0".

SW39 No. 1 ~ No. 7 Reserved
Set to "0".

SW39 No. 8 Reserved
Set to "1".

SW40 No. 1 Reserved
Set to "1".

SW40 No. 2 ~ No. 4 Reserved
Set to "0".

SW40 No. 5, No. 6 Reserved
Set to "1".

SW40 No. 7, No. 8 Reserved
Set to "0".

SW41 No. 1 Reserved
Set to "1".

SW41 No. 2 ~ No. 4 Reserved
Set to "0".

SW41 No. 5 Reserved
Set to "1".

SW41 No. 6 ~ No. 8 Reserved
Set to "0".

SW42 No. 1 ~ No. 8 Reserved
Set to "0".

SW43 No. 1 ~ No. 8 Reserved
Set to "0".

SW44 No. 1 ~ No. 8 Reserved
Set to "0".

SW45 No. 1 ~ No. 8 Reserved
Set to "0".

SW46 No. 1 ~ No. 8 Reserved
Set to "0".

SW47 No. 1 ~ No. 8 Reserved
Set to "0".

SW48 No. 1 ~ No. 8 Reserved
Set to "0".

SW49 No. 1 ~ No. 8 Reserved
Set to "0".

SW50 No. 1 ~ No. 8 Reserved
Set to "0".

SW51 No. 1 ~ No. 8 Reserved
Set to "0".

SW52 No. 1 ~ No. 8 Reserved
Set to "0".

SW53 No. 1 ~ No. 8 Reserved
Set to "0".

SW54 No. 1 ~ No. 8 Reserved
Set to "0".

SW55 No. 1 ~ No. 8 Reserved
Set to "0".

SW56 No. 1 ~ No. 8 Reserved
Set to "0".

SW57 No. 1 ~ No. 8 Reserved
Set to "0".

SW58 No. 1 ~ No. 8 Reserved
Set to "0".

SW59 No. 1 ~ No. 8 Reserved
Set to "0".

SW60 No. 1 ~ No. 8 Reserved
Set to "0".

SW61 No. 1 F.A.S.T. (RMS) mode
Used to determine a function of remote maintenance system (F.A.S.T.).

SW61 No. 2 Reserved
Set to "0".

SW61 No. 3 Verification stamp
End stamp:
It is set whether the red round mark is stamped at the bottom margin of the document of every page in the memory input mode and document sending mode or not.

SW61 No. 4 Day light saving
The day light saving function ON/OFF is set.

SW61 No. 5, No. 6 Key buzzer volume
Key buzzer volume:
The sound volume of key inputting buzzer and other buzzers is set.

SW61 No. 7, No. 8 Reserved
Set to "0".

SW62 No. 1, No. 2 Speaker volume
Speaker volume:
The sound volume of the speaker in the on-hook mode is set.

SW62 No. 3 Reserved
Set to "1".

SW62 No. 4 Reserved
Set to "0".

SW62 No. 5, No. 6 Ringer volume
Ringer volume:
The calling sound volume of CI signal receiving is set.

SW62 No. 7, No. 8 Reserved
Set to "0".

SW63 No. 1 Reserved
Set to "0".

SW63 No. 2 Reserved
Set to "1".

SW63 No. 3, No. 4 Reserved
Set to "0".

SW63 No. 5 Reserved
Set to "1".

SW63 No. 6 Reserved
Set to "0".

SW63 No. 7 Reserved
Set to "1".

SW63 No. 8 Reserved
Set to "0".

SW64 No. 1 Header registration
When setting this switch to "1", registering senders is protected.

SW64 No. 2 Reserved
Set to "0".

SW64 No. 3 Continuous serial polling
Turns ON/OFF the continuous polling function.

SW64 No. 4, No. 5 Time interval for continuous serial polling
Used to set the interval time for continuous serial polling. Normally set to no interval (0 minute).

SW64 No. 6, No. 7 Reserved
Set to "0".

SW64 No. 8 Quick on line function
It is selected whether auto dial call is activated in the memory input mode when one document is completely read or when all pages are completely read.

SW65 No. 1, No. 2 Cassette selection
To set selective modes for detail paper cassettes of the printer.

00:	Manual	To select detail paper in the first priority cassette in accordance with setting by SW65 3-8 and SW65 1-3. If the detail paper in the first priority cassette runs short, the second priority cassette will be used.
01:	Automatic 1	To automatically select detail paper with optimum size among the first to third priority cassettes in accordance with setting by SW65 3-8 and SW65 1-3. The optimum paper is selected by every page. If all the cassettes have the same size paper, paper will be selected according to the cassette priority.
10:	Automatic 2	To automatically select detail paper with optimum size among the first to third priority cassettes in accordance with setting by SW65 3-8 and SW65 1-3. At the start of printing, the optimum paper is adopted only for the first page. Thereafter the same cassette selected for the first page will be used from the second page and after. If all the cassettes have the same size paper, paper will be selected according to the cassette priority.
11:	Except the above	01: the same setting as in the case of Automatic 1

SW65 No. 3 ~ No. 5 The 1st priority cassette
To select the first priority cassette.

001:	1st paper feeder (MP-TRAY)
010:	2nd paper feeder
011:	3rd paper feeder
Except the above	Printing started from the possible paper feeder

SW65 No. 6 ~ No. 8 The 2nd priority cassette
To select the second priority cassette.

000:	Not used (To set in case of using only paper feeder that has been set in the first priority cassette)
001:	1st paper feeder (MP-TRAY)
010:	2nd paper feeder
011:	3rd paper feeder
Except the above	Not used

SW66 No. 1 ~ No. 3 The 3rd priority cassette
To select the third priority cassette.

000:	Not used (To set in case of using only paper feeder that has been set in the first /second priority cassette)
001:	1st paper feeder (MP-TRAY)
010:	2nd paper feeder
011:	3rd paper feeder
Except the above	Not used

SW66 No. 4, No. 5 Cassette selection of separate page
The supply origin of a separate page is set.

SW66 No. 6 ~ No. 8 Reserved
Set to "0".

SW67 No.1, No. 2 Power save mode
The heater mode of a printer is set.

SW67 No. 3 ~ No. 5 Density adjustment of print bias
The density of printing is set.

It can be also set in the print diagnosis mode.

SW67 No. 6, No. 7 Drum life detection
The detection mode of Drum life is set.

SW67 No. 8 Reserved
Set to "0".

SW68 No. 1, No. 2 Distinctive ring pattern
The distinctive ring patter is set for country.

SW68 No. 3 Reserved
Set to "0".

SW68 No. 4 Reserved
Set to "1".

SW68 No. 5, No. 6 Reserved
Set to "0".

SW68 No. 7 Reserved
Set to "1".

SW68 No. 8 Reserved
Set to "0".

SW69 No. 1 Reserved
Set to "1".

SW69 No. 2, No. 3 Reserved
Set to "0".

SW69 No. 4 Reserved
Set to "1".

SW69 No. 5 Reserved
Set to "0".

SW69 No. 6, No. 7 Reserved
Set to "1".

SW69 No. 8 Reserved
Set to "0".

SW70 No. 1 Reserved
Set to "1".

SW70 No. 2 Reserved
Set to "0".

SW70 No. 3 Reserved
Set to "1".

SW70 No. 4 ~ No. 7 Reserved
Set to "0".

SW70 No. 8 Reserved
Set to "1".

SW71 No. 1, No. 2 The default resolution for copying
In case of copying without pressing the RESOLUTION key, resolution will be super fine.

SW71 No. 3 Reserved
Set to "0".

SW71 No. 4 Reserved
Set to "1".

SW71 No. 5 Reserved
Set to "0".

SW71 No. 6, No. 7 Picture quality priority mode

Used to set the transmission mode which is automatically selected when the MODE key is not pressed. In the copy mode, however, the fine mode is automatically selected unless the MODE key is manually set to another mode.

SW71 No. 8 Reserved
Set to "0".

SW72 No. 1 Reserved
Set to "1".

SW72 No. 2 Reserved
Set to "0".

SW72 No. 3 Reserved
Set to "1".

SW72 No. 4 ~ No. 8 Reserved
Set to "0".

SW73 No. 1 ~ No. 5 Reserved
Set to "0".

SW73 No. 6 ~ No. 8 Data reduction
Reduction ratio of receiving is set .
It can be changed even in the optional mode.
To set printing reduction rate of received images.

000:	Automatic
100:	100%
Except the above	100%

SW74 No. 1 Automatic printing of activity report
This soft switch is used to select; whether or not to produce the activity report when the memory is full (about 50 items). An activity report can be produced when the following key entry command is made.

"FUNC", "2", "#", "START"

After producing the activity report, all the data in the memory will be cleared.

When the switch function is set to "0" (NO), the data in memory will be deleted from the oldest as it reaches the maximum memory capacity (approx. 50 items).

SW74 No. 2 Print out of total time and total number of pages on activity report
Used to make a choice of whether the total communication time and pages are recorded in the activity report.

SW74 No. 3 Reserved
Set to "0".

SW74 No. 4 Department function
This model has the department audit feature, it has to be set to 1 to utilize this feature.

SW74 No. 5 ~ No. 8 Department ID digit
Used to set the department ID digit number .
When set to "D" , the number is "4" .

SW75 No. 1 Copy protect switch
When this switch is set to “1”, copy is for bidden.

SW75 No. 2 Cut-off mode (when copy mode)
When in copy, if the scanned data is out of the range of recording, the operator has one of the choices below using the switch.

0: Continue: Data is printed onto the next page with the last 20mm also printed at the beginning of the next page.

1: Cut off: Data scanned out of the limit is cut off (a page is printed.)

SW75 No. 3 Scanning ratio in memory input
In the case of memory transmission, etc., only letter size (A4) documents can be stored in the memory. To input B4 documents into the memory, therefore, the B4 documents must be reduced to letter size (A4) or the both ends of the B4 documents will be cut off to input the center letter-size (A4) portion. This switch provides the selection.

0: Reduced to A4 size and inputted.

1: Both ends are cut off and the center portion (A4 size) is inputted.

SW75 No. 4 Overseas communication mode selection function
When this switch is set to "1", the communication is Super G3 mode can be turned off by pressing the "SPACE" key before sending operation, for the transmission set after that (including polling).

SW75 No. 5 Reserved
Set to "0".

SW75 No. 6 ~ No. 8 Reduce ratio when copy mode
Reduction ratio of copying is set .
It can changed even in the optional mode.

SW76 No. 1, No. 2 Reserved
Set to "0".

SW76 No. 3, No. 4 Density adjustment (when Fine/STD mode)
This is used for density adjustment in fine/standard mode. Adjust the density according to that of frequently used original.

Set to "Dark" for darker reading (either in the auto or the dark mode) of light original. Set to "Light" for lighter reading (either in the auto or the dark mode) of dark original.

Set to "Dark only in dark mode" for darker reading only in the dark mode.

SW76 No. 5, No. 6 Density adjustment (when half-tone mode)
This is used for density adjustment in the half tone. Setting procedures are the same as SW46 No. 3 and No. 4.

SW76 No. 7 MTF correction in half-tone mode
In the half tone mode, image area is separated from character area and processed separately to eliminate unclear character transmission. This switch is used to change the criteria of judgement of separation. When "Strong" (= 1) is selected, more area is judged as character area, providing clearer characters.

On the contrary, however, edges of image area may be emphasized.

It is advisable to restrict the use of this function only when clear characters must be transmitted, and to use the function of "Weak" (= 0) for general cases.

SW76 No. 8 MTF intensity in half-tone mode
This allows selection of MTF correction (dimness correction) in the half tone mode. When "NO" (= 1) is selected, the whole image becomes soft and mild, On the contrary, however, mildness of characters will be reduced. Normally set to "NO" (= 1).

SW77 No. 1 Cassette define LTR / A4:Tray
A4 cassette can be used .
Set "0" or "1" for all of three bits.
Do not change the setting during printing.

SW77 No. 2 Cassette define LTR / A4:Upper
A4 cassette can be used .
Set "0" or "1" for all of three bits.
Do not change the setting during printing.

SW77 No. 3 Cassette define LTR / A4:Lower
A4 cassette can be used .
Set "0" or "1" for all of three bits.
Do not change the setting during printing.

SW77 No. 4, No. 5 Reserved
Set to "1".

SW77 No. 6 ~ No. 8 Reserved
Set to "0".

SW78 No. 1 Reserved
Set to "1".

SW78 No. 2 ~ No. 8 Reserved
Set to "0".

SW79 No. 1 Secure billing code
When the tel. billing code function is ON, the operation of secure billing code is enabled .

SW79 No. 2 Pause with SHIFT key
The SHIFT key pause time is set.

SW79 No. 3 Reserved
Set to "0".

SW79 No. 4 ~ No. 8 Z key pause time (250ms unit)
The Z key pause time is set.

SW80 No. 1 Separate feature
The separate mode ON/OFF is set.

SW80 No. 2 ~ No. 4 Reserved
Set to "0".

SW80 No. 5 Addition of header (Sender information)
ON/OFF of addition of header (sender information) to various list is set.

SW80 No. 6 DTMF sending by the panel test
When ten keys are pressed in the Panel Test Mode of the diagnosis, the corresponding DTMF signals are output.

SW80 No. 7 Power save mode
To switch power save mode system either to real time or to timer.

SW80 No. 8 Reserved
Set to "0".

SW81 No. 1 Reserved
Set to "1".

SW81 No. 2 Reserved
Set to "0".

SW81 No. 3 ~ No. 8 Reserved
Set to "1".

SW82 No. 1 Reserved
Set to "0".

SW82 No. 2 Reserved
Set to "1".

SW82 No. 3 Reserved
Set to "0".

SW82 No. 4 Reserved
Set to "1".

SW82 No. 5 ~ No. 8 Reserved
Set to "0".

SW83 No. 1 ~ No. 5 Reserved
Set to "0".

SW83 No. 6 Reserved
Set to "1".

SW83 No. 7 Reserved
Set to "0".

SW83 No. 8 Reserved
Set to "1".

SW84 No. 1 ~ No. 8 Reserved
Set to "0".

SW85 No. 1 ~ No. 4 Reserved
Set to "0".

SW85 No. 5 Reserved
Set to "1".

SW85 No. 6 Reserved
Set to "0".

SW85 No. 7 Reserved
Set to "1".

SW85 No. 8 Reserved
Set to "0".

SW86 No. 1 ~ No. 8 Reserved
Set to "0".

SW87 No. 1 ~ No. 8 Reserved
Set to "0".

SW88 No. 1 ~ No. 8 Reserved
Set to "0".

SW89 No. 1 ~ No. 7 Reserved
Set to "0".

SW89 No. 8 Reserved
Set to "1".

SW90 No. 1, No.2 Reserved
Set to "0".

SW90 No. 3 Reserved
Set to "1".

SW90 No. 4, No. 5 Reserved
Set to "0".

SW90 No. 6 Reserved
Set to "1".

SW90 No. 7 Reserved
Set to "0".

SW90 No. 8 Reserved
Set to "1".

SW91 No. 1 ~ No. 8 Reserved
Set to "0".

SW92 No. 1 Reserved
Set to "0".

SW92 No. 2 Reserved
Set to "1".

SW92 No. 3 Waiting time after dialing
The set up of the call time of the auto dial.
90 sec. or depends on each country's specifications.

SW92 No. 4 Show receiver's name
This switch is used to note the receiver's name on the transaction report and activity report. When this switch is set to "0", the receiver's dial number is printed on the report.

SW92 No. 5 ~ No. 8 Reserved
Set to "0".

SW93 No. 1 ~ No. 8 Reserved
Set to "0".

SW94 No. 1 ~ No. 8 Reserved
Set to "0".

SW95 No. 1 ~ No. 4 Reserved
Set to "0".

SW95 No. 5, No. 6 Reserved
Set to "1".

SW95 No. 7 Reserved
Set to "0".

SW95 No. 8 Reserved
Set to "1".

SW96 No. 1 ~ No. 8 Reserved
Set to "0".

SW97 No. 1 ~ No. 8 Reserved
Set to "0".

SW98 No. 1 ~ No. 8 Reserved
Set to "0".

SW99 No. 1 Reserved

Set to "0".

SW99 No. 2, No. 3 Reserved (For U.S.A.)

Set to "1".

SW99 No. 2, No. 3 Reserved (For Canada)

Set to "0".

SW99 No. 4 ~ No. 6 Reserved
Set to "0".

SW99 No. 7, No. 8 Reserved

Set to "1".

[3] Troubleshooting

1. Fax troubleshooting

Refer to the following actions to troubleshoot any of the problems mentioned in 1-4.

[1] A communication error occurs.

[2] Image distortion produced.

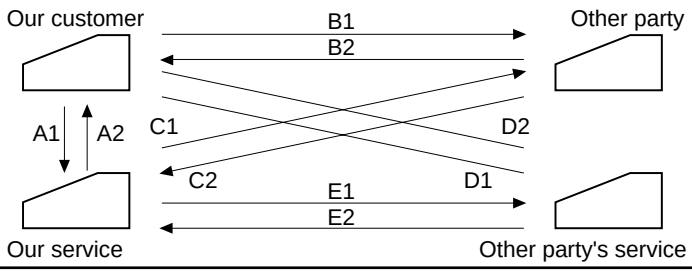
[3] Unable to do overseas communication.

[4] Communication speed slow due to FALLBACK.

- Increase the transmission level SOFT SWITCH 8-4, 5, 6, 7, 8
  May be used in case [1] [2] [3].
- Decrease the transmission level SOFT SWITCH 8-4, 5, 6, 7, 8
  May be used in case [3].
- Apply line equalization SOFT SWITCH 8-1, 2
  May be used in all cases.
- Slow down the transmission speed SOFT SWITCH 6-5, 6, 7, 8
  May be used in case [2] [3].
- Replace the LIU PWB.
  May be used in all cases.
- Replace the control PWB.
  May be used in all cases.

* If transmission problems still exist on the machine, use the following format and check the related matters.

TO: ATT: Ref.No. :
CC: ATT: Date :
FM: Dept :
Sign :

***** Facsimile communication problem *****			Ref.No.:
From: Mr.	Fax Tel No.:		Date:
Our customer	Name		Tel No.
	Address		Fax No.
	Contact person		Model name
Other party	Name		Tel No.
	Address		Fax No.
	Contact person		Model name
Problem mode	Line: Domestic / international	Mode: G3	Phase: A. B. C. D.
	Reception / Transmission	Automatic reception / Manual reception	
		Automatic dialing / Manual dialing / Others	
Frequency:		%	ROM version:
Confirmation item			Please mark problem with an X No problem is: 0

A1	A2	B1	B2	C1	C2	D1	D2	E1	E2

Transmission level setting is ( ) dB at our customer

Transmission level ( ) dBm
Reception level ( ) dBm
By level meter at B1 and B2

Comment	
Countermeasure	

**** Please attach the G3 data and activity report on problem. ****

[4] Error code table

1. Communication error code table

G3 Transmission

Code	Final received signal	Error Condition (Receiver side)
0	Incomplete signal frame	Cannot recognize bit stream after flag
1	NSF, DIS	Cannot recognize DCS signal by echo etc. Cannot recognize NSS signal (FIF code etc)
2	CFR	Disconnects line during reception (carrier missing etc)
3	FTT	Disconnects line by fallback
4	MCF	Disconnects line during reception of multi page Cannot recognize NSS, DCS signal in the case of mode change
5	PIP or PIN	The line is hung up without replying to telephone request from the receiving party.
6	RTN or RTP	Cannot recognize NSS, DCS signal after transmit RTN or RTP signal.
7	No signal or DCN	No response on receiver side or DCN signal received* (transmitter side)
8	–	Owing to error in some page the error could not be corrected although the specified number of error retransmission was attempted.
11	–	Error occurred after or while reception by the remote (receiving) machine was revealed to be impossible.
12	–	Error occurred just after fallback.
13	–	Error occurred after a response to retransmission end command was received.

G3 Reception

Code	Final received signal	Error Condition (Receiver side)
0	Incomplete signal frame	Cannot recognize bit stream after flag
1	NSS, DCS	Cannot recognize CFR or FTT signal Disconnects line during transmission (line error)
2	NSC, DTC	Cannot recognize NSS signal (FIF code etc)
3	EOP	Cannot recognize MCF, PIP, PIN, RTN, RTP signal
4	EOM	Cannot recognize MCF, PIP, PIN, RTN, RTP signal in the case of mode change
5	MPS	The line is hung up without replying to communication request.
6	PR1-Q	Cannot recognize PIP, PIN signal in the case of TALK request
7	No signal or DCN	No response in transmitter (cannot recognize DIS signal) or DCN signal received* (receiver side)
8	–	Error occurred upon completion of reception of all pages.
9	–	Error occurred when mode was changed or Transmission/Reception switching was performed.
10	–	Error occurred during partial page or physical page reception.
11	–	Error occurred after or during inquiry from the remote (transmitting) machine as to whether reception is possible or not.
12	–	Error occurred during or just after fallback.
13	–	Error occurred after the retransmission end command was received.
14	–	Error occurred after the voice communication command was received.

Super G3 mode

Error Code	Transmission Errors	Reception Errors
E-16	Same as E-0	Same as E-0
E-17	Same as E-1	Same as E-1
E-18	Same as E-2	Same as E-2
E-19	-	Same as E-8
E-20	Same as E-4	Same as E-9
E-21	-	Same as E-10
E-22	-	-
E-23	Same as E-7	Same as E-7
E-24	Same as E-8	-
E-25	Same as E-11	Same as E-11
E-26	Same as E-12	Same as E-12
E-27	Same as E-13	Same as E-13
E-28	-	Same as E-14
E-29	Error occurred during handshaking for super G3 mode	
E-30		
E-31		

<Reference> Details of E-29 ~ 31

E-29	Handshaking error in V.8 negotiation procedure
E-30	Handshaking error in V.34 line probing procedure
E-31	Handshaking error in V.34 HDX training procedure

2. Service call error massage

Message	Description
REMOVE ORIGINAL (S)	Document is stuck at the auto-feeder.
NO PAPER (TRAY)	No recording paper on the tray.
NO PAPER (UPPER)	No recording paper in the upper cassette.
NO PAPER (LOWER)	No recording paper in the lower cassette.
NO PAPER (BOTH CASS.)	No recording paper in either cassette.
NO PAPER (TRAY, UPPER)	No recording paper in the tray nor in the upper cassette.
NO PAPER (TRAY, LOWER)	No recording paper in the tray nor in the lower cassette.
NO PAPER	No recording paper anywhere.
SIZE ERROR	The size of the recording paper is wrong.
LASER ERROR	The laser unit abnormal.
POLYGON ERROR	The polygon motor abnormal.
FAN MOTOR ERROR	The fan motor abnormal.
CHECK UPPER CASSETTE	The upper cassette is not set properly.
CHECK LOWER CASSETTE	The lower cassette is not set properly.
CHECK BOTH CASSETTES	Neither cassette is set properly.
TONER EMPTY	There is no toner left.
PCU COMM. ERROR	No data communication between the PCU and the control PWB.
RX DOCUMENT TRAY OFF	The document-receiving tray is not set properly.
HIGH VOLTAGE ERROR	Abnormality with the high-voltage portion.
HEATER LOW ERROR	Heater temperature is too low.
HEATER HIGH ERROR	Heater temperature is too high.
WARMING UP ERROR	Warming up is not done properly.
CHECK COVER OR DRUM	Printer cover may be open, or the drum cartridge may not be set properly.
DRUM LIFE OVER	Drum life is over.
PAPER JAM	Recording paper is stuck inside.

[5] Overseas communication mode

(1) Function

The Super G3 (V.34) mode is susceptible to influence of line. It is better to use the G3 (V.17) mode for communication in specific line conditions.

This function is provided to support this status.

(2) Memory retransmission

In case of memory transmission the retransmission is performed in the following conditions.

No.	Conditions	Operation
1	When a communication error occurred in communication in the Super G3 mode due to page 1 MCF reception failure.	The retransmission of this communication is performed after setting Super G3 to OFF (in V.17 mode).
2	When a communication error occurred in communication in the Super G3 mode after reception of page 1 MCF.	The retransmission of this communication is performed without setting Super G3 to OFF (in V.34 mode).
3	When a communication error occurred in retransmission.	Retransmission is performed again according to 1 and 2 above.
4	When a communication error occurred in sequential system communication.	Retransmission is performed according to 1 and 2 above for each station.

(3) Original transmission

Since retransmission is not provided for the original transmission, recovery by the method 1 is impossible. Accordingly, for the original transmission set Super G3 to OFF, and apply V.17 mode.

(4) Super G3 function setting to OFF by operator

A function to set Super G3 function to OFF is provided for operator in addition to the functions described in items (2) and (3) above. However, this function is invalid in the default mode.

It is made valid only when requested by using the soft switch.

SW75 No.4 = 0: Operation invalid (Default) 1: Operation valid

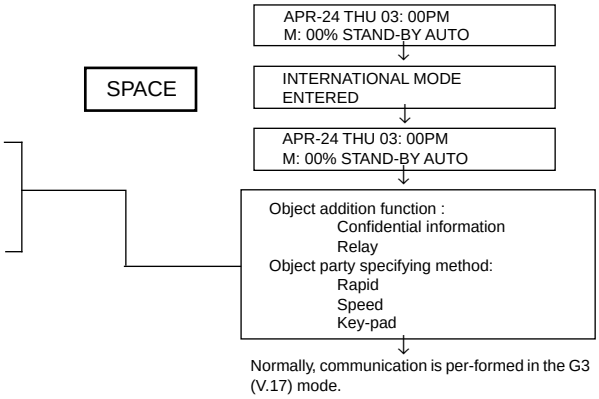
(4)-1 Setting method

① Before communication operation press the SPACE key, lifting the key overlay to set the communication to OFF in the Super G3 mode.

② Perform the transmission/polling operation.

The operations which are taken as objects are the following.

* Instantaneous single station auto-dial transmission (original/memory)
* Time-specified single station transmission
* Program instantaneous single station transmission
* Program time-specified single station transmission
* Time-specified single station polling
* Program instantaneous single station polling
* Program time-specified single station polling
* Manual transmission (original/memory)
* Batch transmission



(4)-2 Canceling method (this setting is not canceled while one of the following operations is not performed)

① After setting operation (pressing the SPACE key) press the STOP key on the WAIT screen.

② After setting operation (pressing the SPACE key) hold for one minute.

In case of operation ① and ② the display shown right will appear for 2 seconds.

INTERNATIONAL MODE
CANCELED

③ Perform the communication operation (all the communication operations).

④ Start up again the machine (turn on power).

(4)-3 Others

① The operation to set Super G3 to OFF is valid only for one communication which is per-formed successively.

[6] Administrator mode in the personal book function

In the personal book function, 30 books from 01 to 30 may be set. It is also possible to set the administrator as a special book.

(a) Setting : Same as the normal personal book, except for the book number to be specified as "00".
(b) Switching to the administrator mode : Press the "PERSONAL BOOK" key and enter the "passcode of the book00" in the stand-by mode.
(c) Cancellation of the administrator mode : Press the "STOP" key and enter "1" in the stand-by mode.
(d) Function in the administrator mode : When the following list is output, the information of all books is read out.
1) TELEPHONE NUMBER LIST
2) RELAY GROUP LIST
3) PROGRAM/GROUP LIST
4) TIMER LIST
5) MEMORY STATUS REPORT
"PERSONAL BOOK LIST" may be output in item 16 of the "MENU + 2 : LISTMODE".

CHAPTER 3. MECHANICAL DESCRIPTION

[1] Mechanical description

1. Facsimile block

1-1. Document feed block and diagram

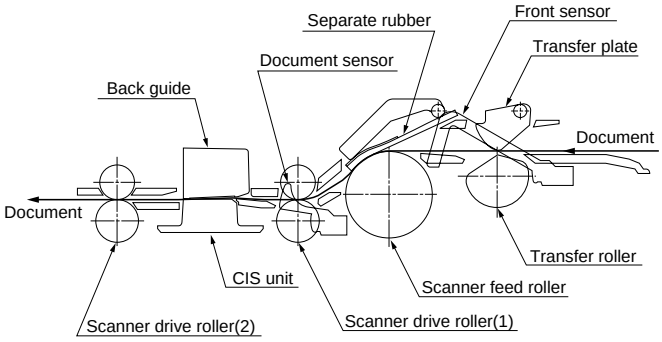


Fig. 1

2. Document feed operation

1) As shown in Fig.1, the document set in the hopper (the front sensor is on) is fed with the let out roller and paper feed roller which rotate together with the pulse motor.

2) When a specified number of pulses are received from the document sensor after the document lead edge is sensed, scanning will be started.

3) When a specified number of pulses are received from the document sensor after the document rear edge is sensed, scanning will be ended to discharge the document to the tray.

4) If the front sensor is on (the document is set up in the hopper), the next document is supplied and fed nearly when the last document is completely read and discharged. If the front sensor is off (no document is set up in the hopper), the drive will be stopped when the document is discharged to the tray.

3. Hopper mechanism

3-1. General view

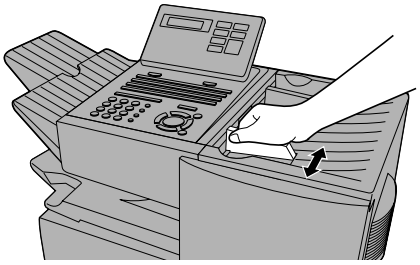


Fig. 2

The hopper is used to align documents with the document guides adjusted to the paper width.

NOTE: Adjust the document guides before and after inserting the document.

3-2. Automatic document feed

1) The structure with secure paper feed of the transfer roller and secure separation of the separation rubber plate system is employed. The transfer roller is semicircular as to be rotated only when the paper feed roller is driven with the 2-step paper feed clutch mechanism. Moreover, the separation securely done by running the paper feed and transfer rollers more slowly than the feed roller.

2) Document separation system:
Friction + speed reduction ratio + roller backlash separation system

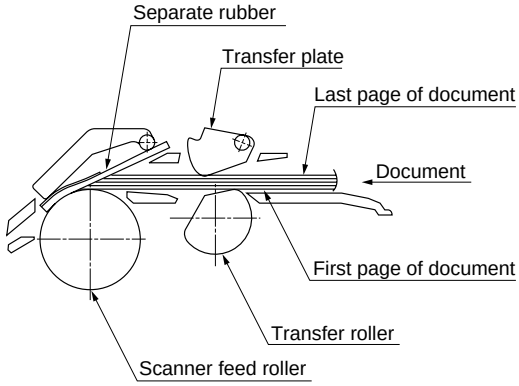


Fig. 3

3-3. Loading the documents

1) Make sure that the documents are of suitable size and thickness, and free from creases, folds, curls, wet glue, wet ink, clips, staples and pins.

2) Place documents face down in the hopper.

- Adjust the document guides to the document width.
- Align the top edge of documents and gently place them into the hopper. The first page under the stack will be taken up by the feed roller to get ready for transmission.

NOTE: 1) Curled edge of documents, if any, must be straighten out.
2) Do not load the documents of different sizes and/or thicknesses together.

3-4. Documents applicable for automatic feed

		Product specifications	
	Indication	Lower Limit	Upper Limit
Weight indication	Japanese indication Size 4 × 6	45kg paper	70kg paper
	Metric system indication	52g/m^2	80g/m^2
	American indication LB system indication	14 LB	20 LB
Thickness indication	Metric system indication	0.06mm	0.1mm
	Inch system indication	0.0024"	0.0035"
Document size	Document size Range	(148mm × 128mm) ~ W letter (279.4mm × 432mm)	
		A4 (210mm × 297mm)	
		Letter (216mm × 279mm)	
Number of ADF sheets	Document size Weight	B6 ~ Letter/A4 size	50 sheets
		B4 size/Legal	20 sheets
		W letter size	1 sheet
		90 kg (104g/m^2) or more 135 kg (157g/m^2) or less	1 sheet
Paper quality	Kind	Paper of fine quality/bond paper/ Kent paper	

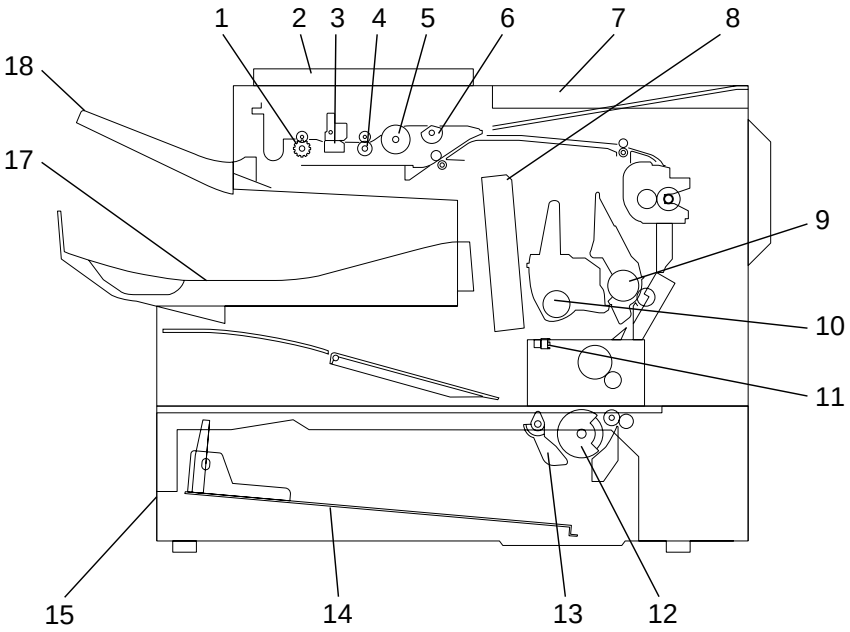
NOTE: Double-side coated documents and documents on facsimile recording paper should be inserted manually.

Documents corresponding to a paper weight heavier than 90kg and lighter than 135kg are acceptable for manual feed.

Documents heavier than 135kg in terms of the paper weight must be duplicated on a copier to make it operative in the facsimile.

[2] Printer description

1. COMPONENTS LAYOUT



1. Scanner Drive Roller 2
2. Operation Panel
3. CIS Unit
4. Scanner Drive Roller 1
5. Scanner Feed Roller
6. Transfer Roller
7. Upper Cover
8. Printer Head
9. Drum Cartridge
10. Toner Cartridge
11. Paper Empty Sensor (PE1)
12. 2nd PU Roller Unit
13. 2nd Paper Sensor lever
14. Cassette Push Up Plate
15. 2nd Option Cassette (Option : FO-CS1)
17. Received Document Tray
18. ADF Exit Tray

Fig. 1

2. DRIVE SECTION

2-1. Overview

The main motor (M1) transmits the drive to the rollers of the printer and the 2nd paper cassette unit via each gear as shown below.

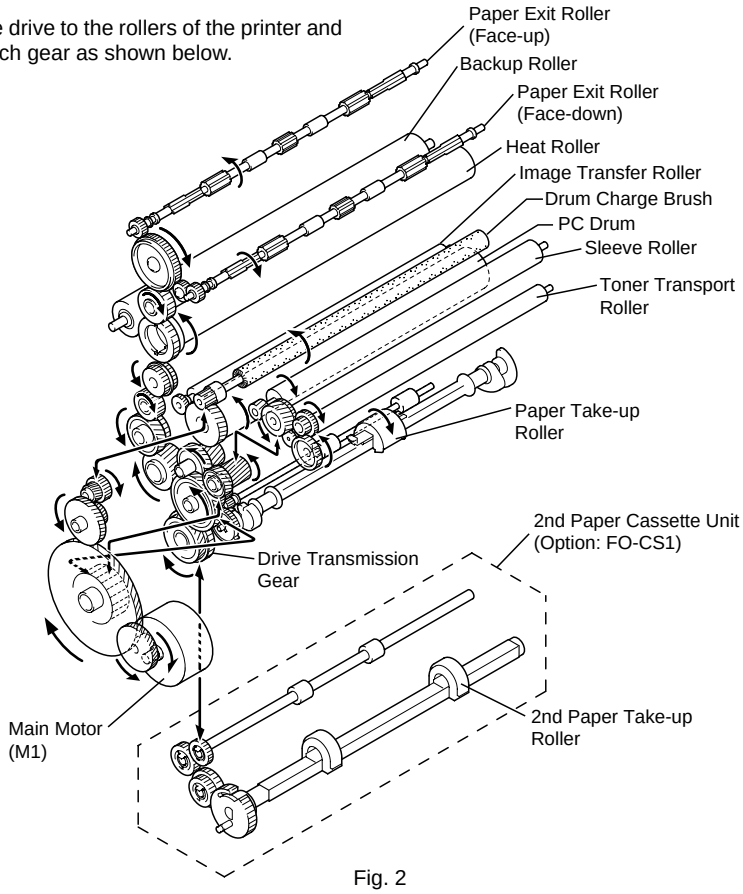


Fig. 2

3. PRINTER ENGINE ELECTRICAL COMPONENTS LAYOUT

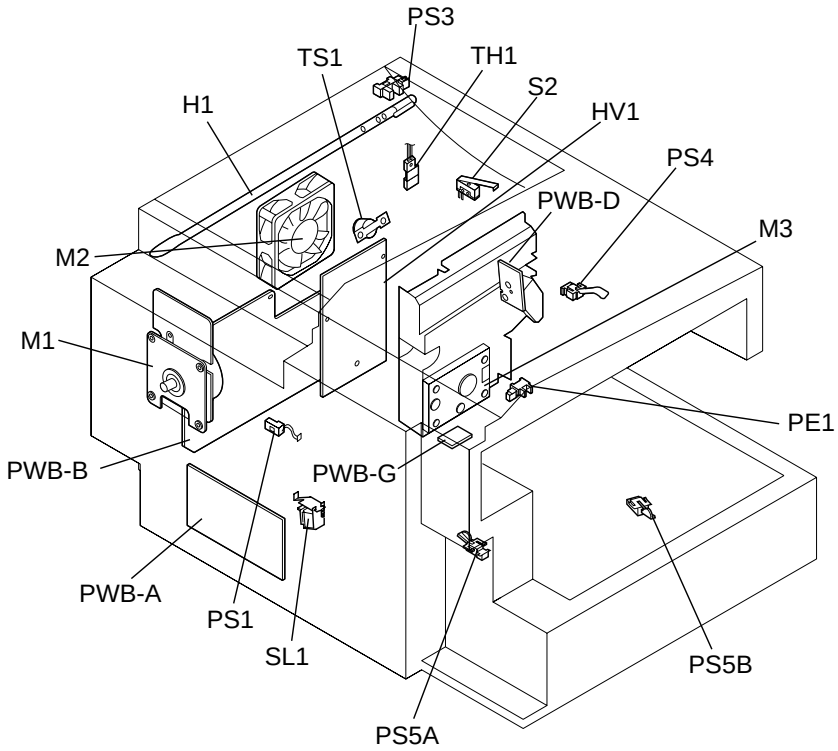


Fig. 3

4. ELECTRICAL PARTS IDENTIFICATION

Symbol	Name	Function
PWB-A	Printer PWB unit	Communicates with the control PWB and controls all printer operation.
PWB-B	Power Supply PWB unit	Converts the power voltage from AC voltage into DC voltage and supplies that to H1.
PWB-D	Laser Diode Drive PWB unit (Inside of the Print Head Unit)	Detects the start point of printing via the laser diodes and SOS sensor, and illuminates the PC Drum with the laser beam according to the image signals.
PWB-G	Toner Empty PWB unit	Toner quantity is read by the analog signal. (Use of LED)
M1	Main Motor	Provides the drive source for the printer.
M3	Polygon Motor (Inside of the Print Head Unit)	A regular heptagon mirror is installed, and rotates at high speed and makes the laser scan in scanning direction.
M2	Cooling Fan Motor	Exhausts heat from the body.
H1	Heater Lamp	A halogen lamp that supplies heat to the Fusing Rollers. (600 W)
HV1	High Voltage PWB unit	Supplies power to the following sections: - Drum Charge Brush: Charged voltage - Developing Sleeve Roller: Developing bias voltage - Developing Toner Regulation Plate: Developing blade voltage - Developing Toner Collecting Plate: Developing Lower Seal voltage - Image Transfer Roller: Image transfer voltage
PE1	Paper Empty Sensor	Detects that a sheet of paper is taken up. The signal is L when paper is detected.
PS1	Paper Take-Up Sensor	Detects that a sheet of paper is taken up. The signal is H when paper is detected.
PS3	Paper Exit Sensor	Detects when the paper is fed out. The signal is H when the paper is detected.
PS4	Paper Out Sensor	Paper out detection signal. The signal L when the paper is detected.
PS5A	Received Docuent Tray Sensor	The signal is L when there is a tray cover.
PS5B	Paper Size Sensor	Detects the size of the paper. Letter: signal H, Legal: signal L.
S2	Interlock Switch	Detects the opening or closing of the Top Cover. Cuts output voltage (except 5 VDC) when the Top Cover is open.
SL1	Paper Take-Up Solenoid	Transmits the drive of the Main Motor to the Paper Take-up Roller.
TH1	Thermistor	Detects the temperature of the Heat Roller, measures the temperature on the surface of the Heat Roller and sends to the Heater control circuit.
TS1	Thermostat	Cuts power to the Heater Lamp (H1) when overheating (215ºC) is detected at the Fusing Section.

5. PAPER PATH

Paper can be fed into the printer from the Multi Purpose Tray (250 sheets) or from the Manual Feed Port (1 sheet).

Installing the 2nd Paper Cassette Unit (FO-CS1) (500sheets) adds another feeding method.

The paper fed by the Paper Take-Up Roller is transported to the Image Transfer Roller, Fusing Roller and then Paper Exit Roller. After this, the paper is fed out onto the Print Tray.

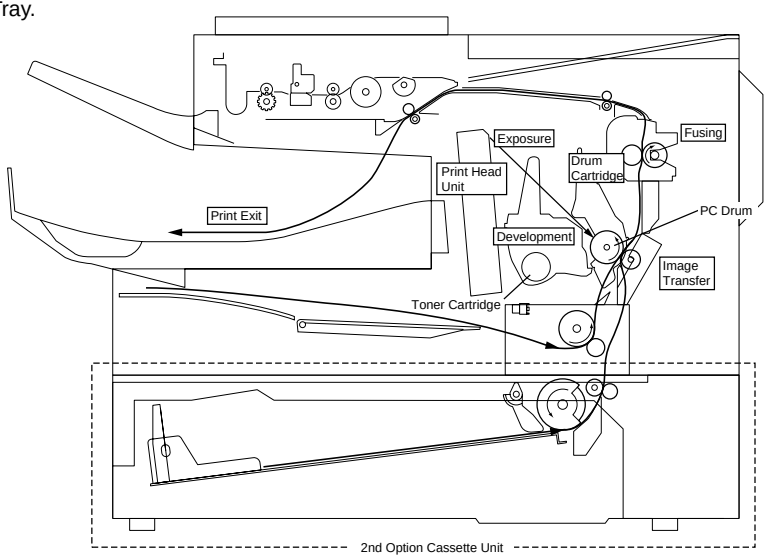


Fig. 4

6. PAPER TAKE-UP SECTION

6-1. Multi-Purpose Tray

When the Paper Take-Up Solenoid (SL1) is energized, the drive of the Main Motor (M1) is transmitted to the Paper Take-Up Roller via the Paper Take-Up Gear (one-way clutch) to turn the Paper Take-Up Roller one revolution. At the same time, the Depressing Cam turns and lifts the Paper Lifting Plate, and the first (top) sheet of paper on the tray is fed to the printer. The Fixed Separating Pad is used for the paper separation system. It prevents the second and subsequent sheets of paper from being fed together with the top sheet. The actual length of the paper is detected using the period of time through which the Paper Take-up Sensor (PS1) remains energized (or through which the paper moves past the sensor) and it is determined whether the actual length matches the paper length specified by the controller.

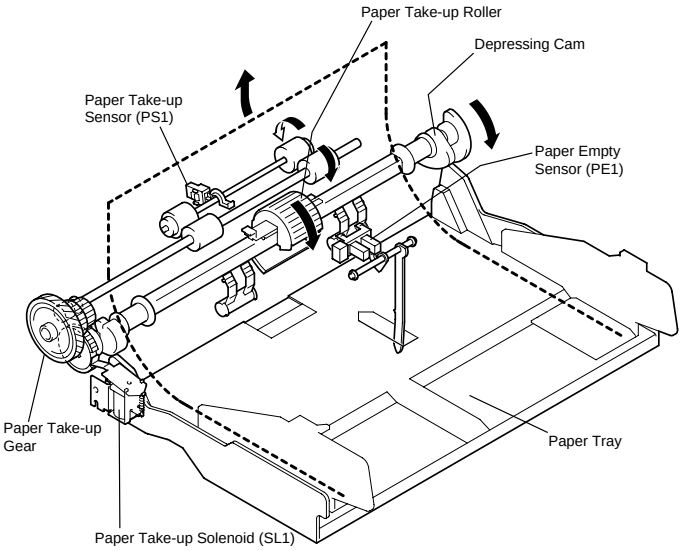


Fig. 5

7. DRUM CHARGE

The PC Drum is charged with static electricity before laser exposure. The Drum Charge Brush and the Pre-charge Film are used for the charging method.
The Drum Charge Brush and Pre-charge Film charging generate little ozone in the printer. Because the charge is directly applied to the PC Drum, the PC Drum can be charged by low voltage. In addition, the charg applied to the PC Drum is stable and even.
The Pre-charge Film supplies the charge to the PC Drum before being charged by the Drum Charge Brush to improve the charging efficiency.
The Drum Charge Brush is turned by the drive of the Main Motor (M1) via a gear.
The electric potential on the surface of the charged PC Drum is approximately-800 V.

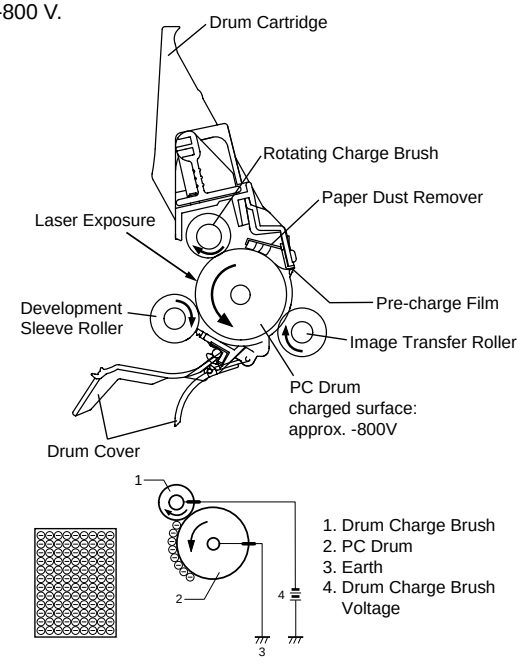


Fig. 6

8. LASER EXPOSURE

Laser exposure is the process of creating an invisible static charge image on the PC Drum by the laser beam emitted from the Print Head Unit. This process is controlled as follows in order to appropriately time image printing.

In the sub-scanning direction (vertical direction)
· When the printer receives the PRINT signal, the Polygon Motor and the Main Motor rotate and the paper is fed into the printer.
· The printing in the sub-scanning direction is started when the Controller PWB sends the VIDEO signal to the Print Head a certain time after the leading edge of the paper activates the Paper Sensor (TOD signal).
· The print starting position for the 2nd line is decided by delaying the VIDEO signal sending timing.

In the scanning direction (horizontal direction)
· The SOS Sensor is installed on the Laser Diode Control PWB to unify the laser emission timing for each scan line.

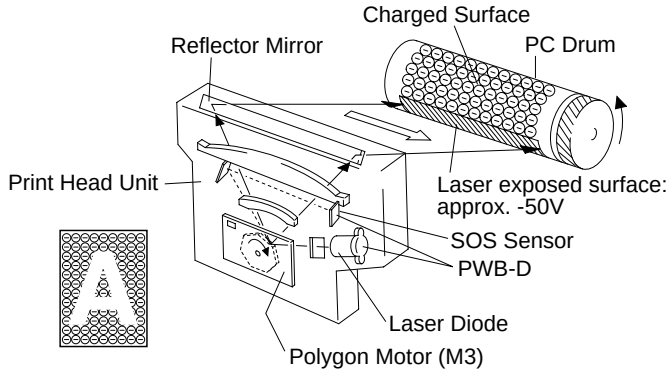


Fig. 7

9. DEVELOPMENT

9-1. Overview

Toner is applied to the invisible static image on the PC Drum and a toner image (developed image) is created on the drum surface.

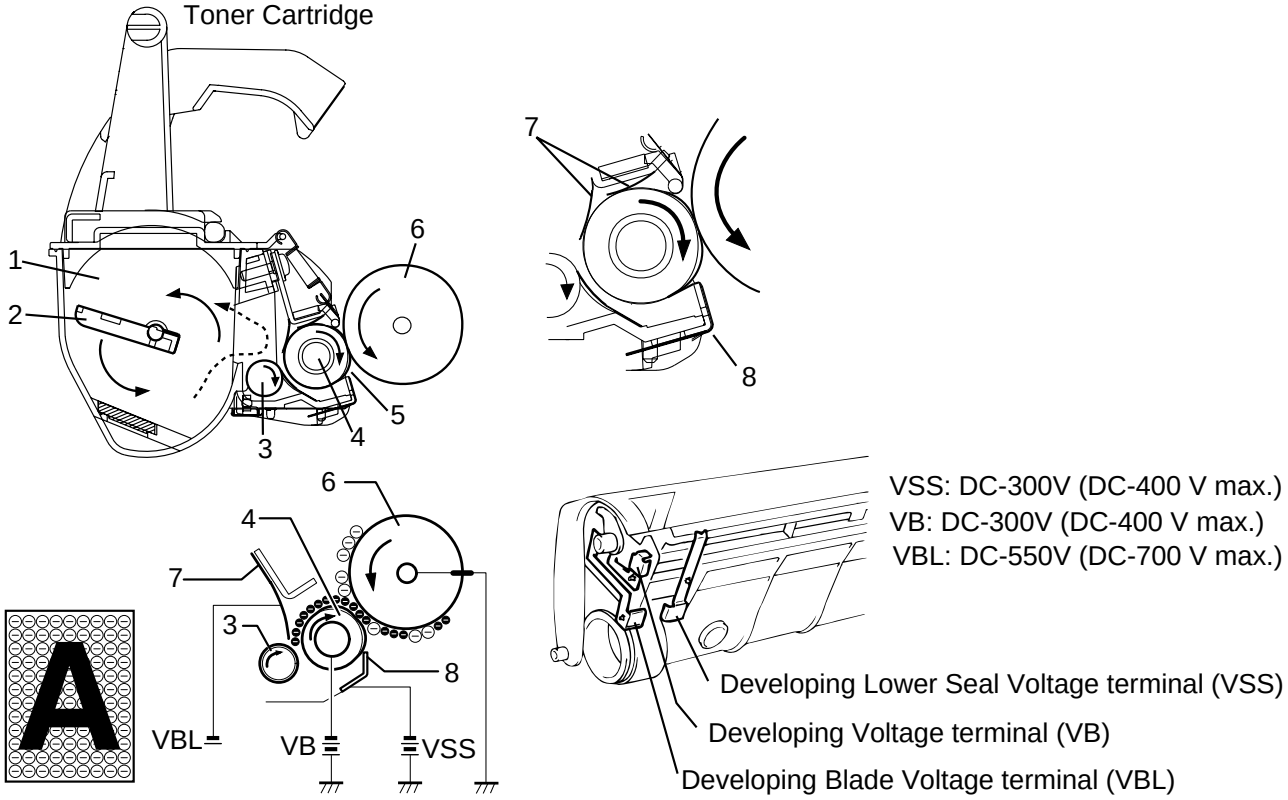


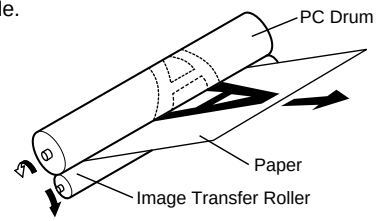
Fig. 8

No.	Part Name	Function
1	Toner Hopper	Contains toner.
2	Toner Agitating Screw	Agitates the toner in the Toner Hopper and sends the toner to the Toner Transport Roller.
3	Toner Transport Roller	Transports the toner to the Sleeve Roller.
4	Sleeve Roller	Turns the Resin Sleeve.
5	Resin Sleeve	Carries the toner to the PC Drum surface for development.
6	PC Drum	Exposed to laser to create an invisible image and rotates to carry the developed image to the paper surface.
7	Toner Blade	Spreads a thin, even coat of toner over the Resin Sleeve. The toner is negatively charged when passing between this Blade and the Resin Sleeve.
8	Bias Seal	Separates toner, which has not been attracted to the PC Drum, from the Resin Sleeve and returns it back to the Buffer Section.

10. IMAGE TRANSFER

10-1. Overview

· Image transfer is the process of transferring the toner image created on the PC Drum in the developing process to paper.
· Roller image transfer is used instead of corona image transfer as the image transfer method.
· In roller image transfer, there is little generation of ozone due to corona discharge. Also, there is no blur of toner because the paper is always pressed by the PC Drum and the Image Transfer Roller.
· When cleaning the Image Transfer Roller and before printing, reverse bias is applied.
· The residual electric potential on the paper is dissipated via a discharge needle.



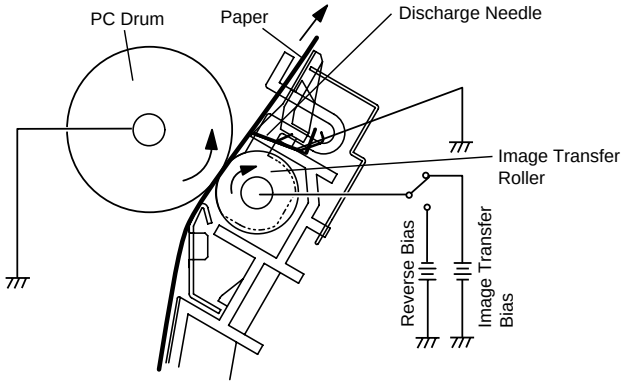


Fig. 9

11. FUSING

11-1. Overview

· The toner image transferred onto the paper is securely fixed to the paper.
· A heat roller system is used as the fusing system. The toner image is fused by the Heat Roller heated by the Heater Lamp (H1), and securely fixed by the pressure between the Heat Roller and Backup Roller.

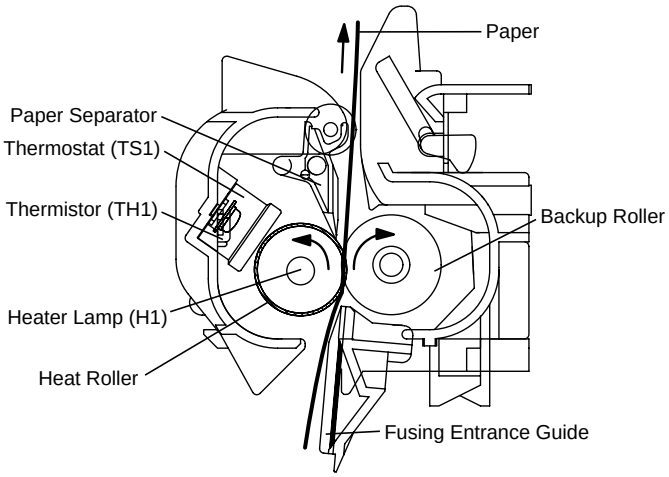


Fig. 10

11-2. Fusing Temperature Control Circuit

· The Thermistor (TH1) detects the surface temperature of the Heat Roller and inputs that analog voltage into IC4-78. Corresponding to this data, the Heater Lamp (H1) ON/OFF signal is output from IC4-55, causing the Heater Lamp (H1) to turn ON or OFF to control the fusing temperature.
· When the Heater Lamp (H1) is not turned OFF even if the Thermistor (TH1) detects a high temperature malfunction (if the surface temperature of the Heat Roller exceeds 230°C), the signal from IC4-79 changes from L to H to turn OFF the Heater Lamp (H1) forcibly.

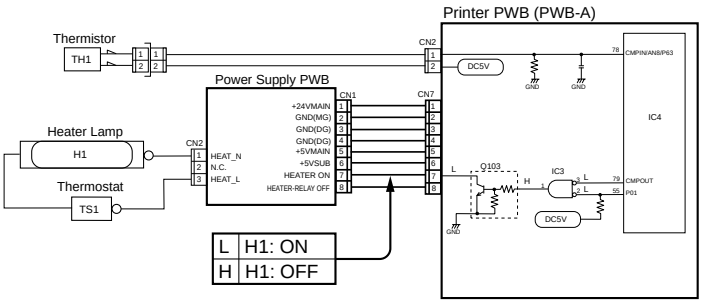


Fig. 11

(At 600 dpi)
The printer is initialized upon power supply. The Heater Lamp then turns on and the printer starts warming up. The temperature is controlled as follows.

Mode 1: The temperature is controlled to maintain 125°C during standby and 210°C during printing. If this mode continues for 300 seconds, the control will shift to mode 2.

Mode 2: The temperature of the Heat Roller falls gradually to about 190°C from about 210°C. If this mode continues for 208 seconds, the control will shift to mode 3.

Mode 3: The temperature is controlled to maintain 125°C during standby and 190°C during printing. Unless an error occurs or the control is opened, this mode is maintained.

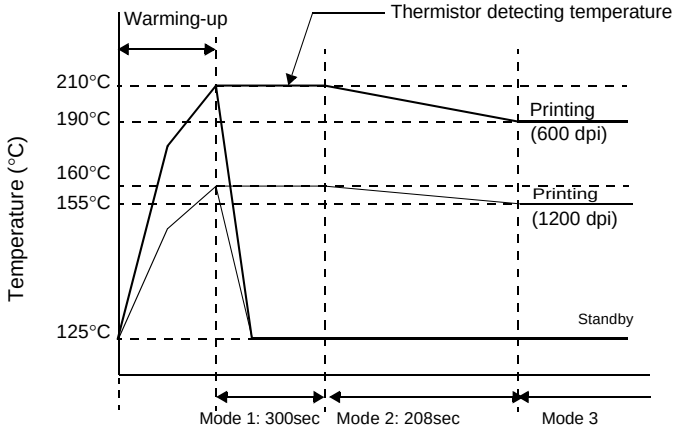


Fig. 12

	Temperature immediately after temperature control start		
The state before discontinuation of temperature control	Less than 50°C	50°C or more, less than 125°C	125°C or more,
Mode 1, warming-up	Mode 1		
Mode 2, 3 or Power OFF	Mode 1	Mode 2	Mode 3

12. PRINT SEQUENCE

Printing is carried out following communication between the engine and controller that determines the timing to be used.
A general outline of the printing sequence is described below.

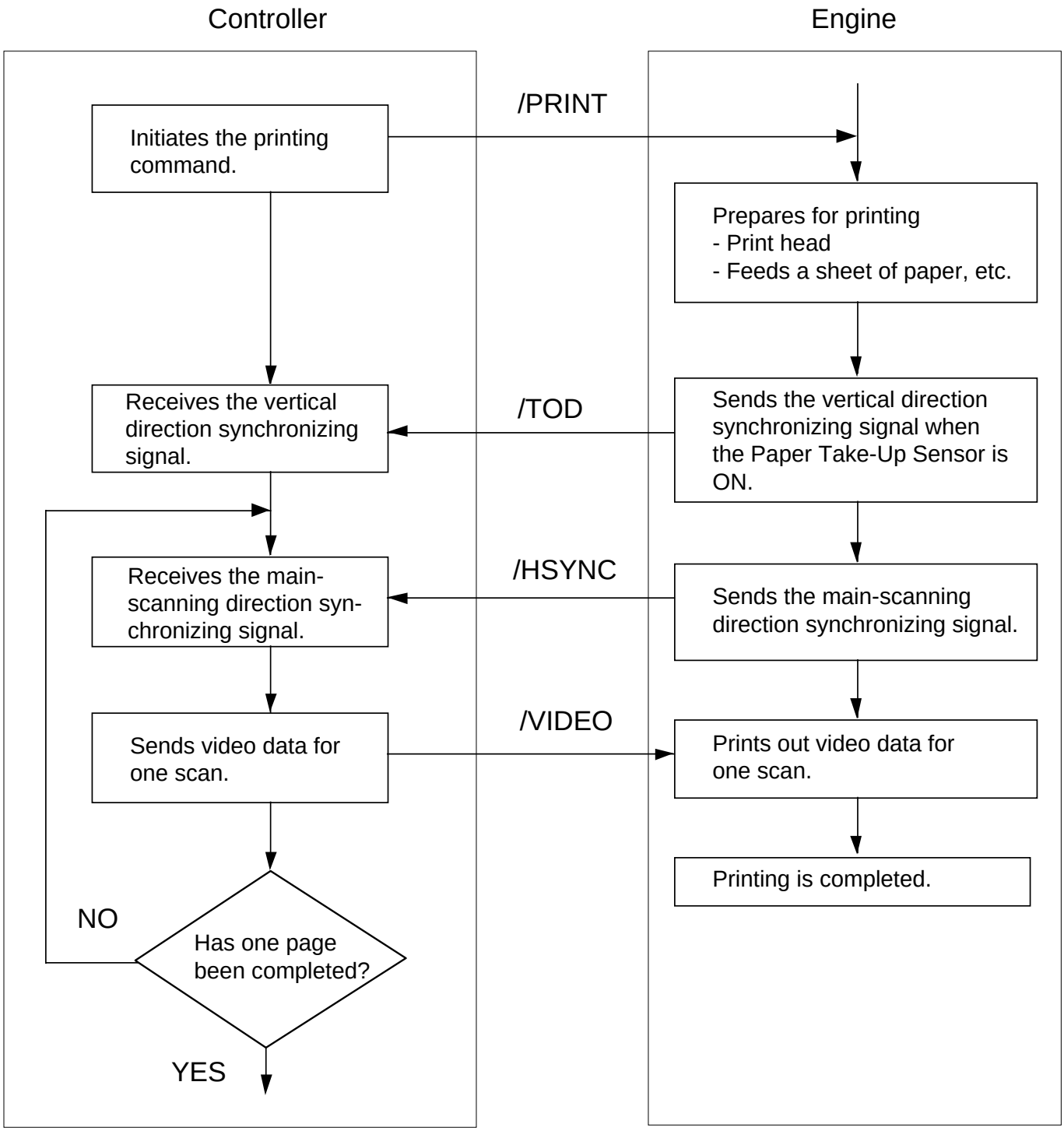


Fig. 13

13. Timing chart

13-1. Print Starting

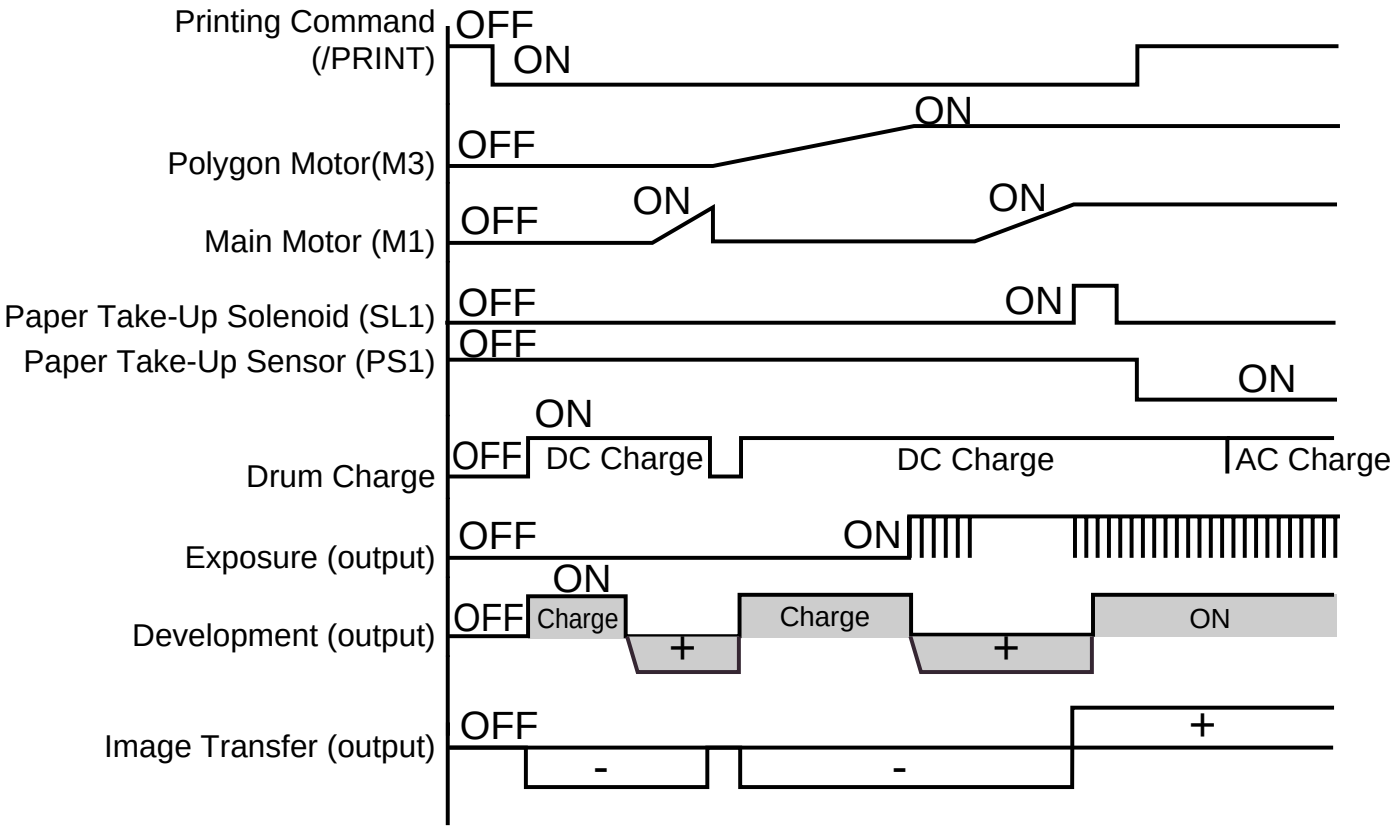


Fig. 14

13-2. Print Ending

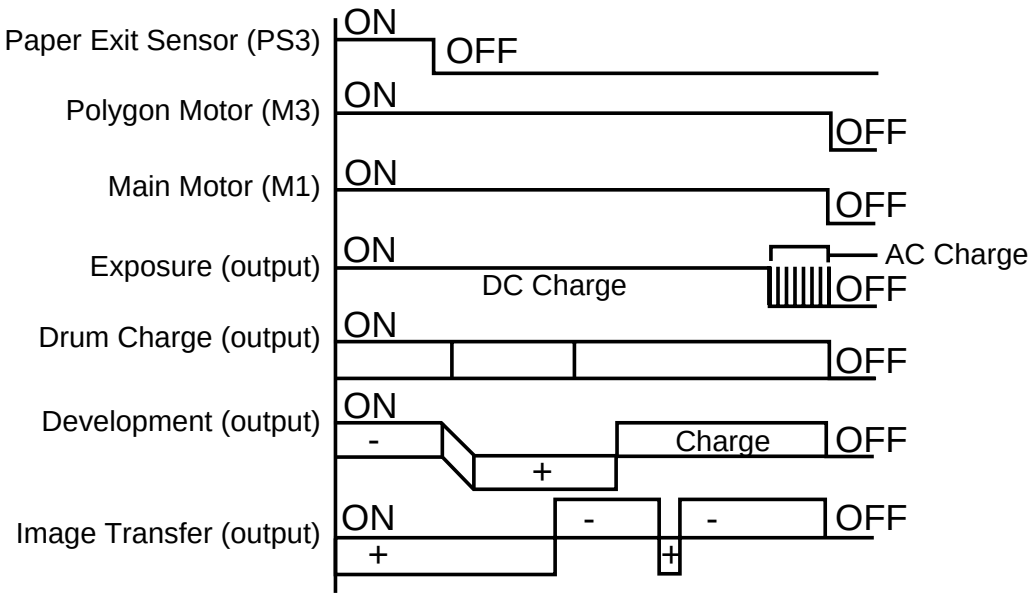


Fig. 15

[3] Disassembly and assembly procedures

- This chapter mainly describes the disassembly procedures. For the assembly procedures, reverse the disassembly procedures.
- Easy and simple disassembly/assembly procedures of some parts and units are omitted. For disassembly and assembly of such parts and units, refer to the Parts List.
- The numbers in the illustration, the parts list and the flowchart in a same section are common to each other.
- To assure reliability of the product, the disassembly and the assembly procedures should be performed carefully and deliberately.

1	**Front cabinet**

Parts list (Fig. 1)

No.	Part name	Q'ty
1	Main unit	1
2	Screw (3×10)	2
3	Screw (3×10)	1
4	Front cabinet	1

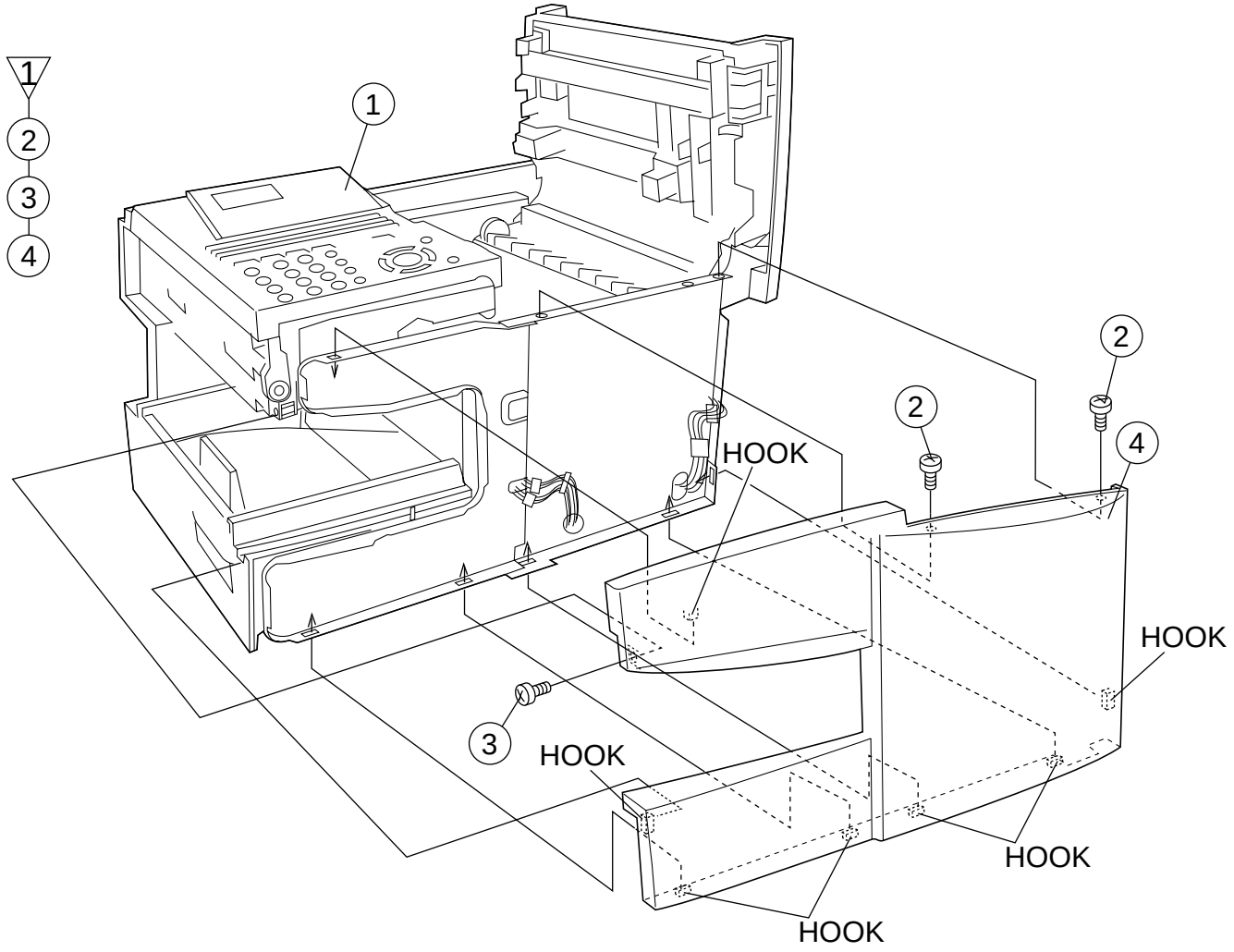


Fig. 1

2	**Rear cabinet**

Parts list (Fig. 2)

No.	Part name	Q'ty
1	Main unit	1
2	Screw (3×10)	1
3	ROM cover	1
4	Screw (3×10)	6
5	Rear cabinet	1

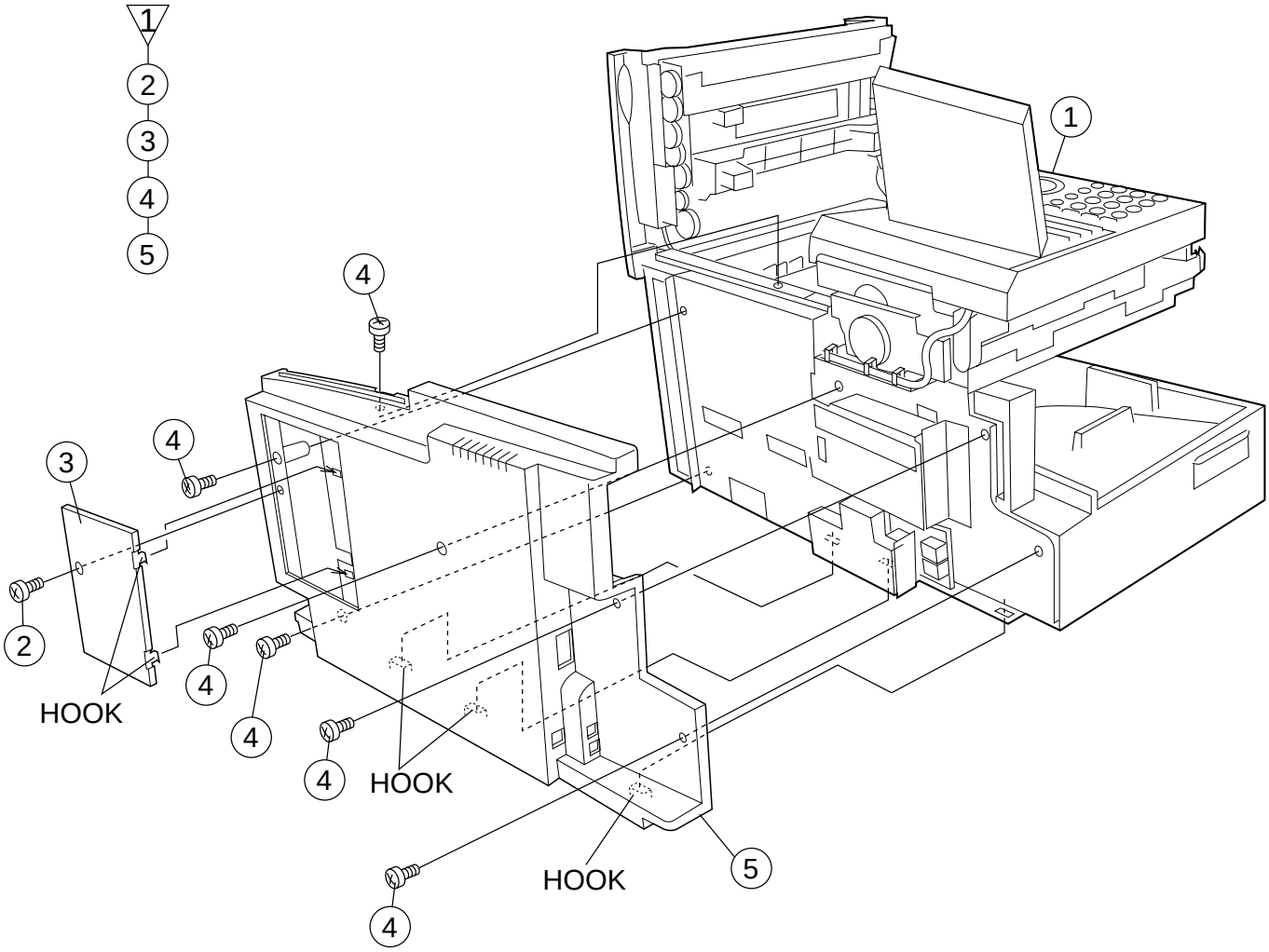


Fig. 2

3	**PWB plate, Right cabinet**

Parts list (Fig. 3)

No.	Part name	Q'ty
1	Main unit	1
2	Screw (3×6)	6
3	PWB plate	1
4	Screw (3×10)	2
5	Right cabinet	1

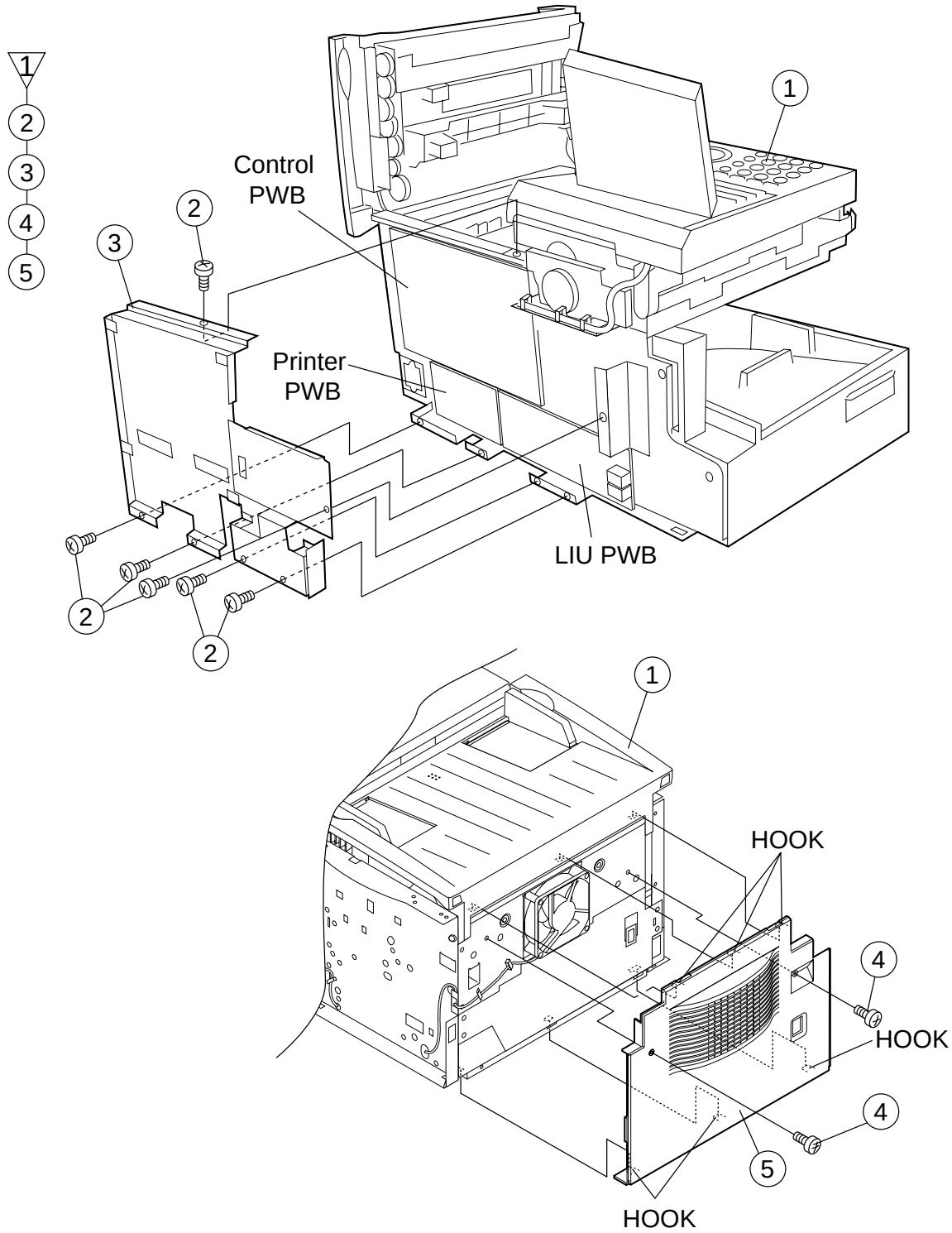


Fig. 3

4	**PWB unit**

Parts list (Fig. 4)

No.	Part name	Q'ty
1	Main unit	1
2	Screw (3×6)	7
3	Screw (3×10)	1
4	Connector	20
5	LIU PWB unit	1
6	Control PWB unit	1
7	Printer PWB unit	1

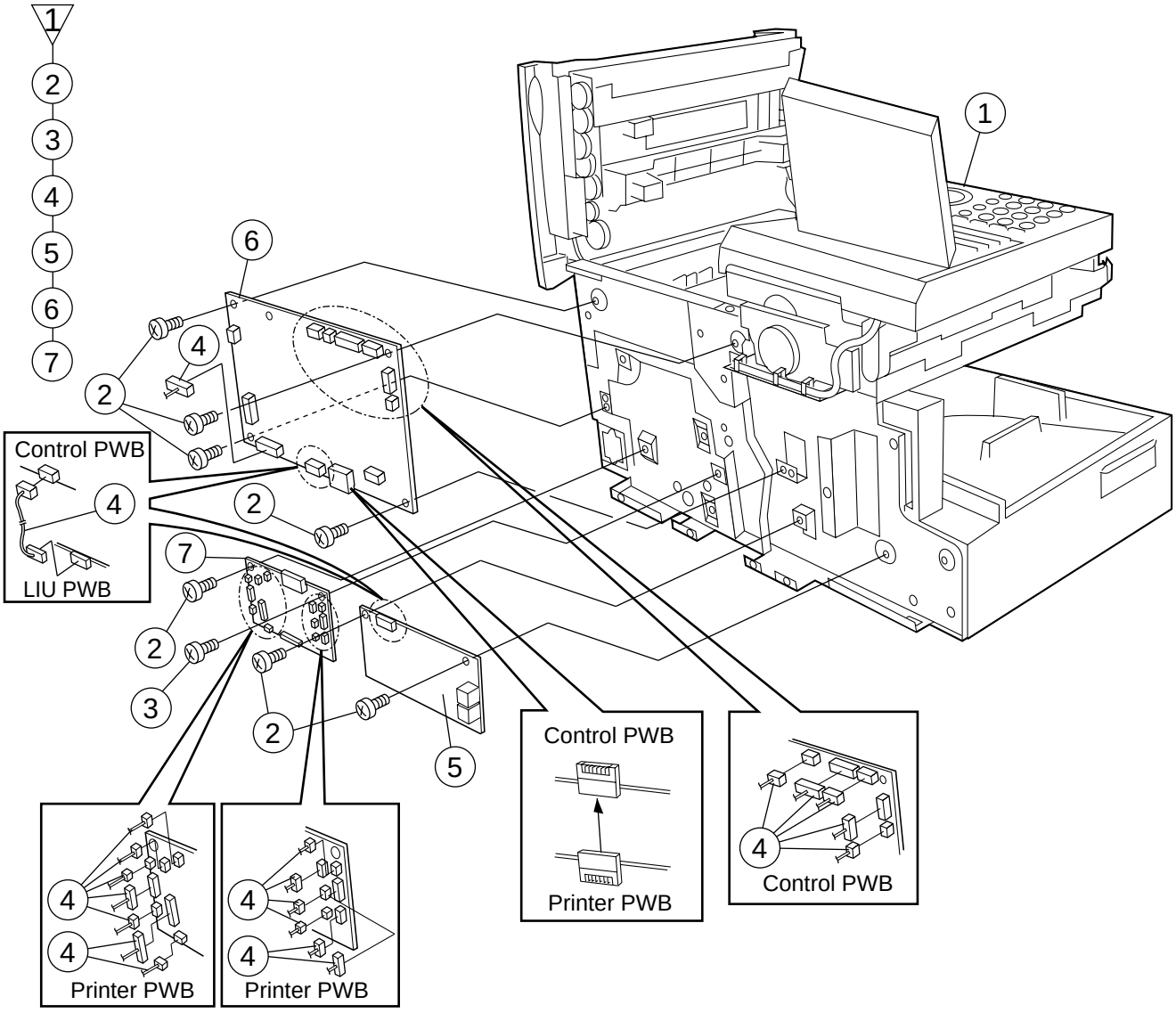
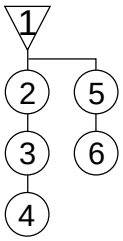


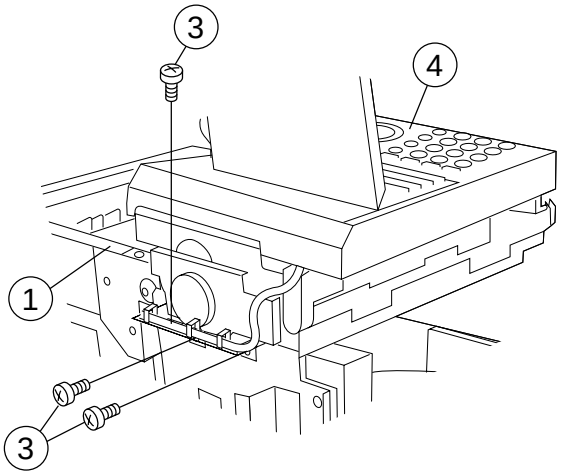
Fig. 4

5 Operation panel unit, Upper cover unit

Parts list (Fig. 5)

No.	Part name	Q'ty
1	Main unit	1
2	Screw (3×10)	1
3	Screw (3×6)	6
4	Operation panel unit	1
5	Screw (3×8)	1
6	Upper cover unit	1





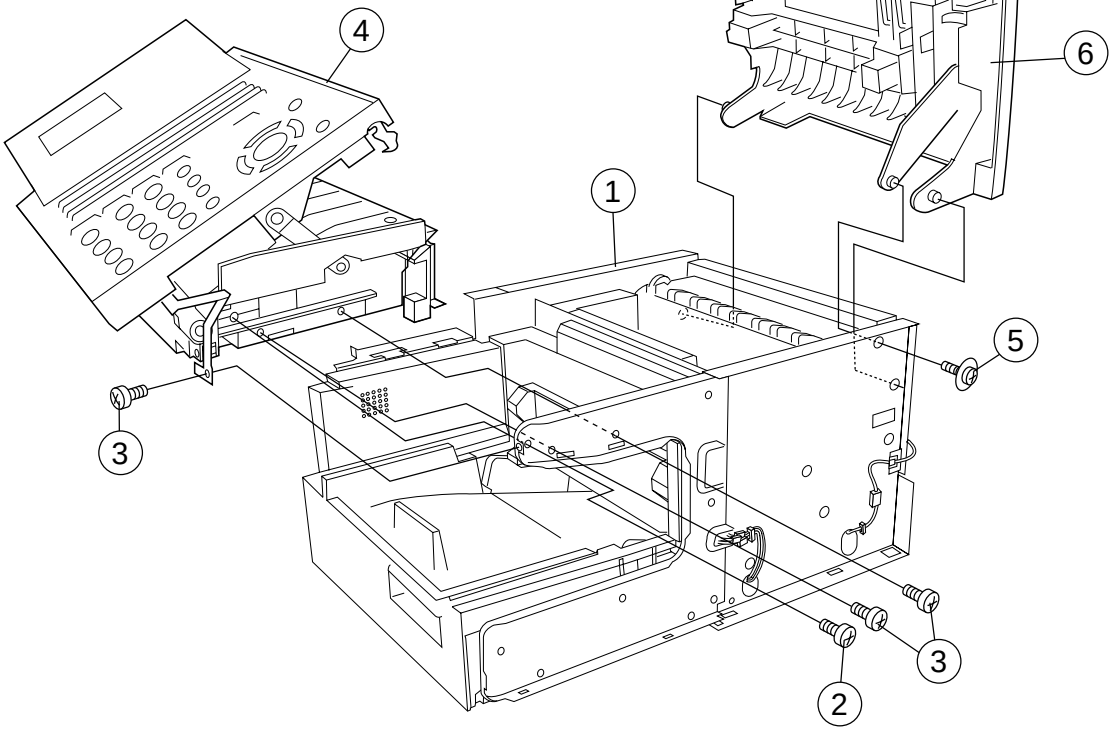


Fig. 5

6 Front left frame, Paper feed tray

Parts list (Fig. 6)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Main unit	1	11	Screw (3×6)	1
2	Screw (3×6)	5	12	Paper feed tray unit	1
3	Screw (3×10)	2	13	Screw (3×10)	1
4	Screw (3×6)	1	14	Tray width guide, front	1
5	Front left frame	1	15	Screw (3×10)	1
6	Screw (3×10)	2	16	Tray width guide, rear	1
7	Speaker holder plate spring	1	17	Connector	2
8	Speaker ass'y	1	18	Sensor	2
9	Inner front cabinet	1	19	Paper feed tray	1
10	Screw (3×10)	2			

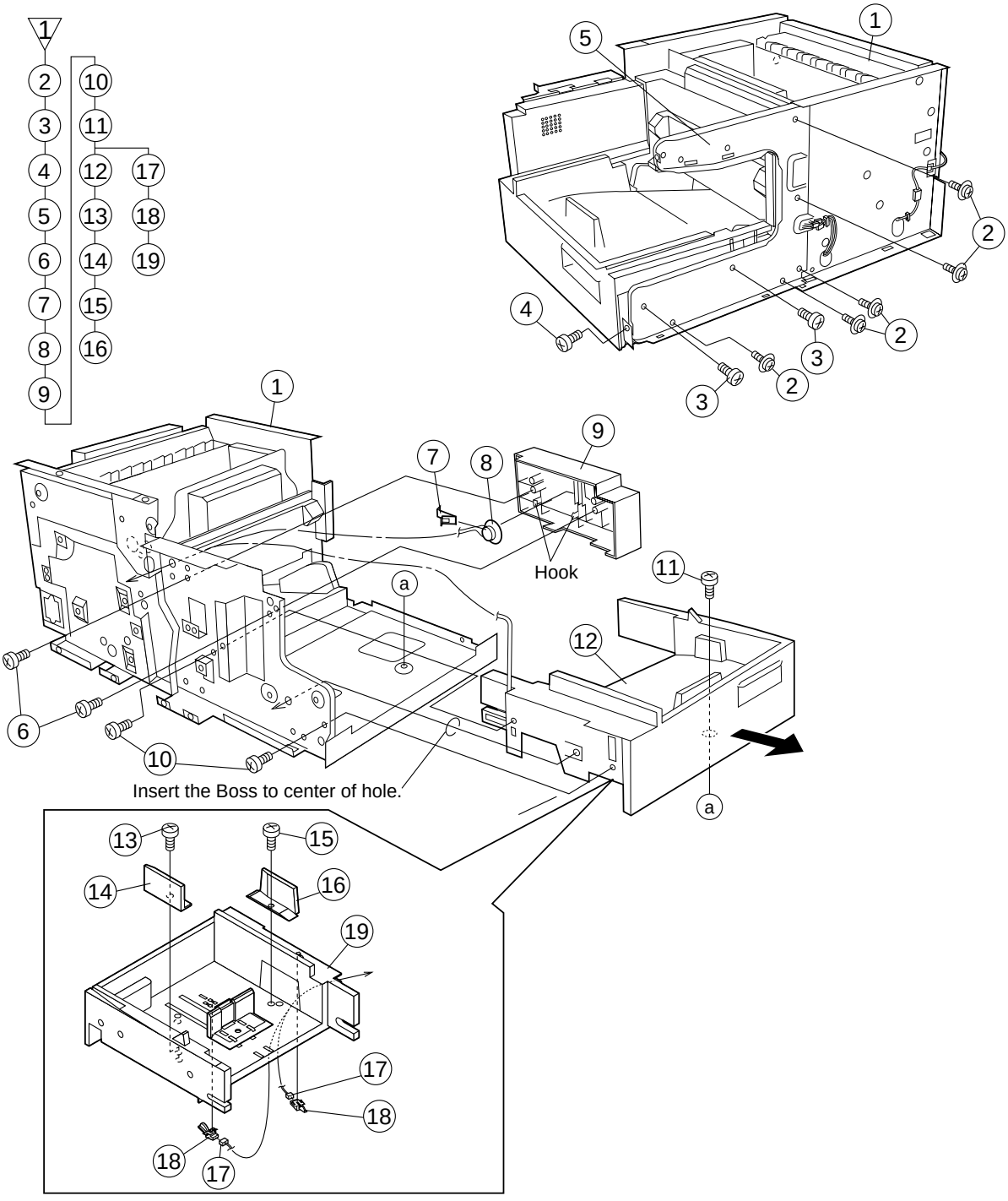


Fig. 6

7 Rear left frame, Bottom left frame

Parts list (Fig. 7)

No.	Part name	Q'ty
1	Main unit	1
2	Screw (3×6)	7
3	Rear left frame	1
4	Screw (3×6)	1
5	Bottom left frame	1

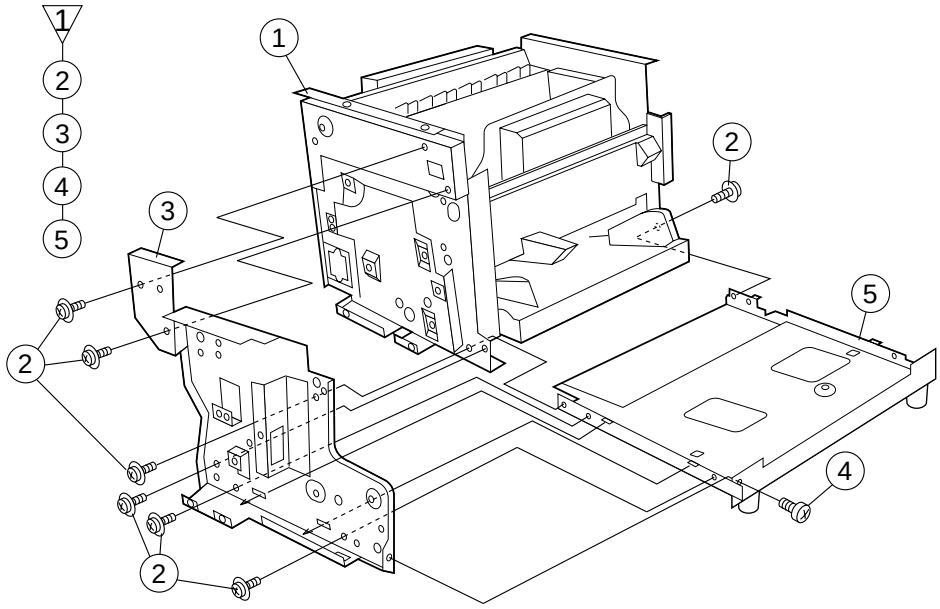


Fig. 7

8 Inner left cabinet unit

Parts list (Fig. 8)

No.	Part name	Q'ty
1	Main unit	1
2	Screw (3×8)	4
3	Inner left cabinet unit	1

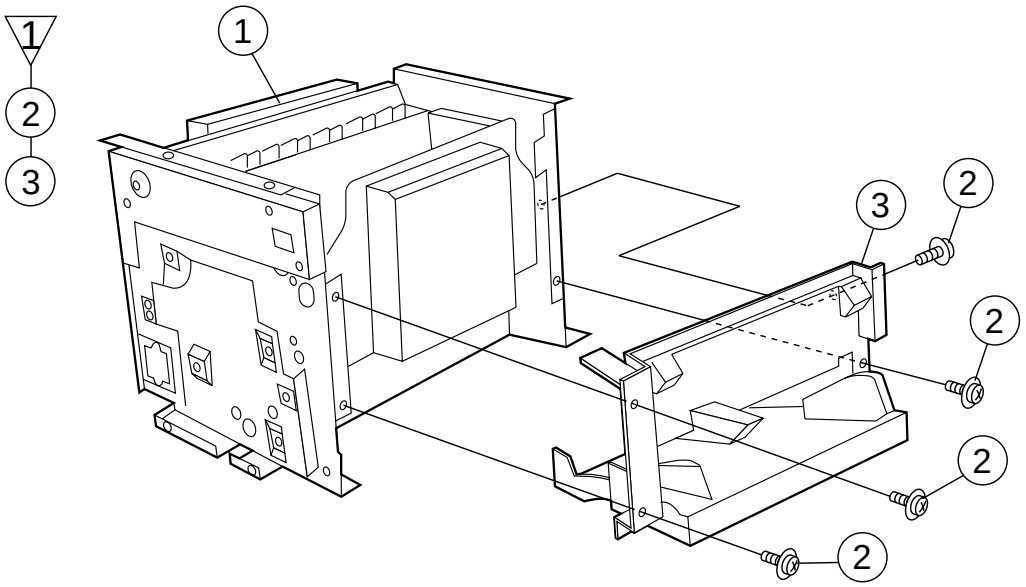


Fig. 8

9 Power supply PWB

Parts list (Fig. 9)

No.	Part name	Q'ty
1	Main unit	1
2	Screw (3×6)	4
3	Connector	4
4	Power supply PWB unit	1
5	Screw (3×6)	3
6	Screw (4×6)	1
7	Power supply PWB plate	1
8	Power supply PWB	1

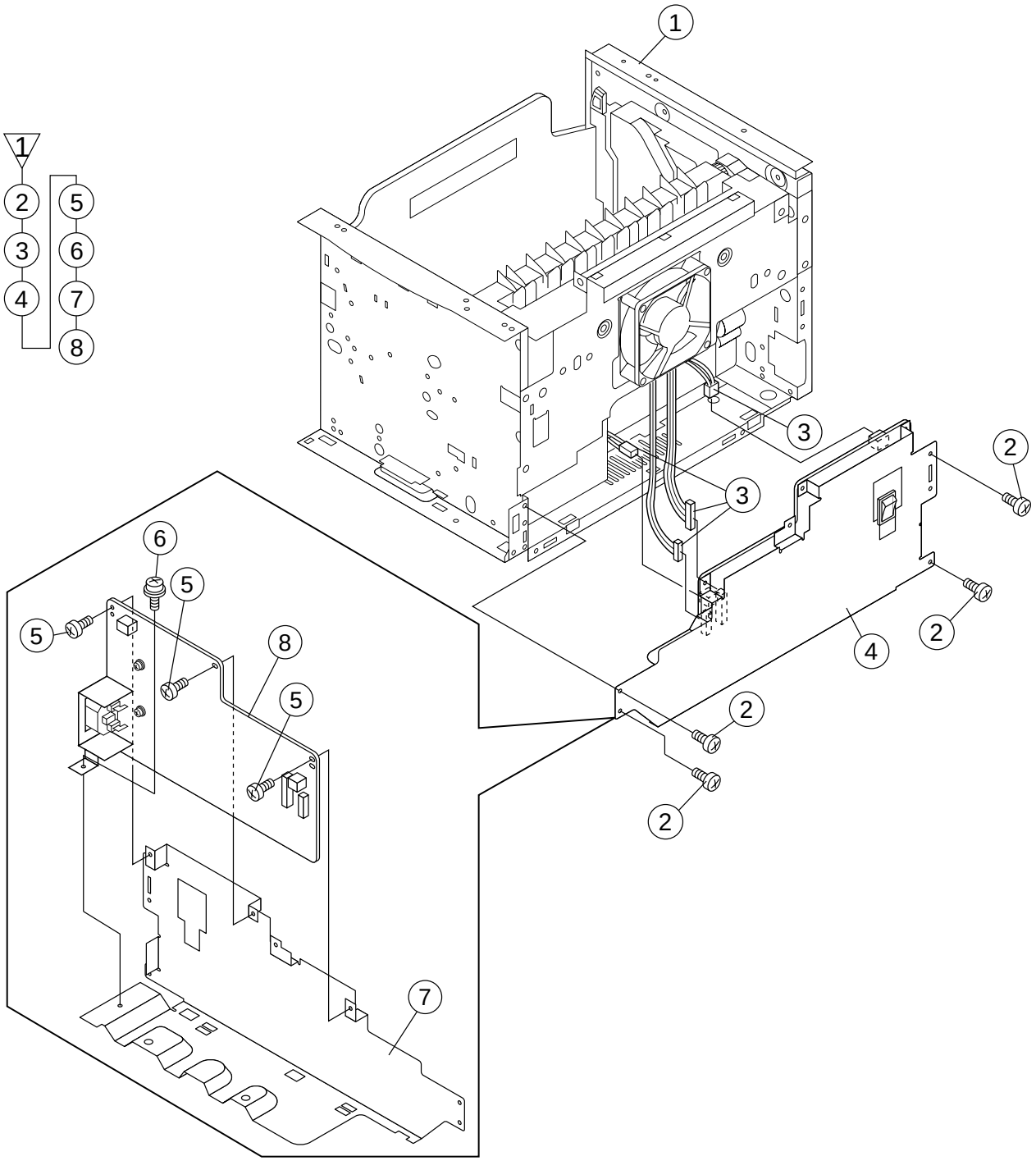


Fig. 9

10 Scanner frame unit (1/2)

Parts list (Fig. 10)

No.	Part name	Q'ty
1	Scanner frame unit	1
2	Screw (3×8)	1
3	Operation panel unit	1
4	Screw (3×10)	5
5	Screw (3×10)	2
6	Document guide upper	1
7	Stopper	1
8	Left upper cabinet	1

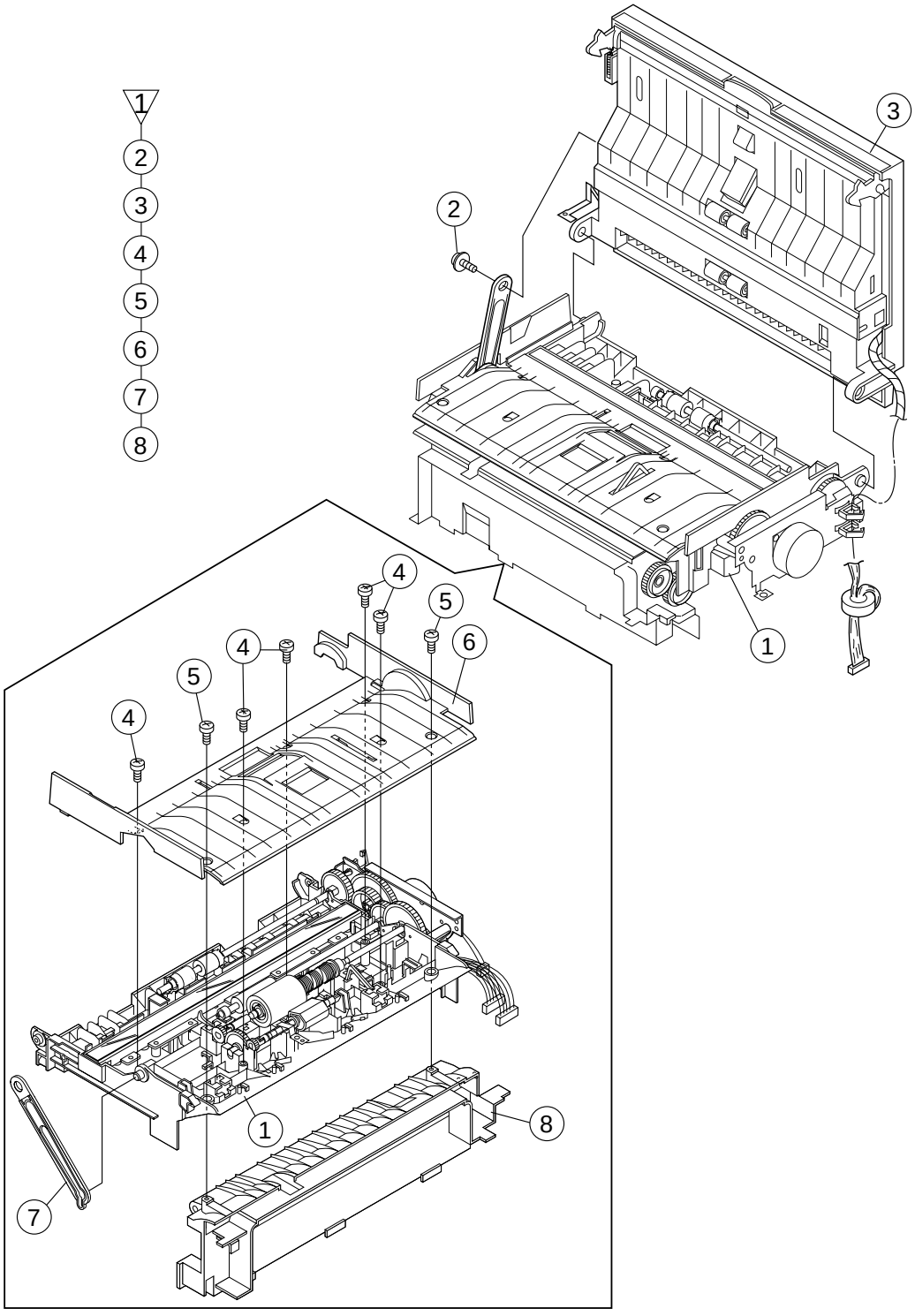


Fig. 10

11 Scanner frame unit (2/2)

Parts list (Fig. 11)

No.	Part name	Q'ty	No.	Part name	Q'ty	No.	Part name	Q'ty
1	Scanner frame unit	1	15	Scanner feed shaft 2	1	29	Screw (3×6)	1
2	Transfer bearing	2	16	Screw (3×10)	1	30	Screw (3×10)	1
3	Feed gear (49z)	2	17	Stopper spring	1	31	SD2 earth spring	1
4	DR bearing	2	18	Transfer idler gear	1	32	Verification stamp (FO-45VS)	1
5	Scanner drive roller 2	1	19	Screw (3×10)	3	33	Document sensor switch	1
6	Scanner drive roller 1	1	20	Drive unit	1	34	Transfer sensor switch	1
7	Scanner bearing 1	2	21	Transfer roller	1	35	Front sensor switch	1
8	Feed gear (73z)	1	22	ADF transfer gear	1	36	Document sensor cable	1
9	Bearing	1	23	CIS unit	1	37	Pinch roller spring	2
10	Scanner feed shaft 1	1	24	CIS cable	1	38	PO pinch roller	2
11	Scanner feed clutch	1	25	Core	1	39	Screw (3×10)	2
12	Scanner feed roller	1	26	CIS spring	2	40	Scanner support plate	1
13	E type ring (5mm)	1	27	Screw (3×6)	1	41	Paper earth brush	1
14	ADF feed gear	1	28	FD1 earth spring	1	42	Screw (3×10)	2
						43	Anti curl piece	2

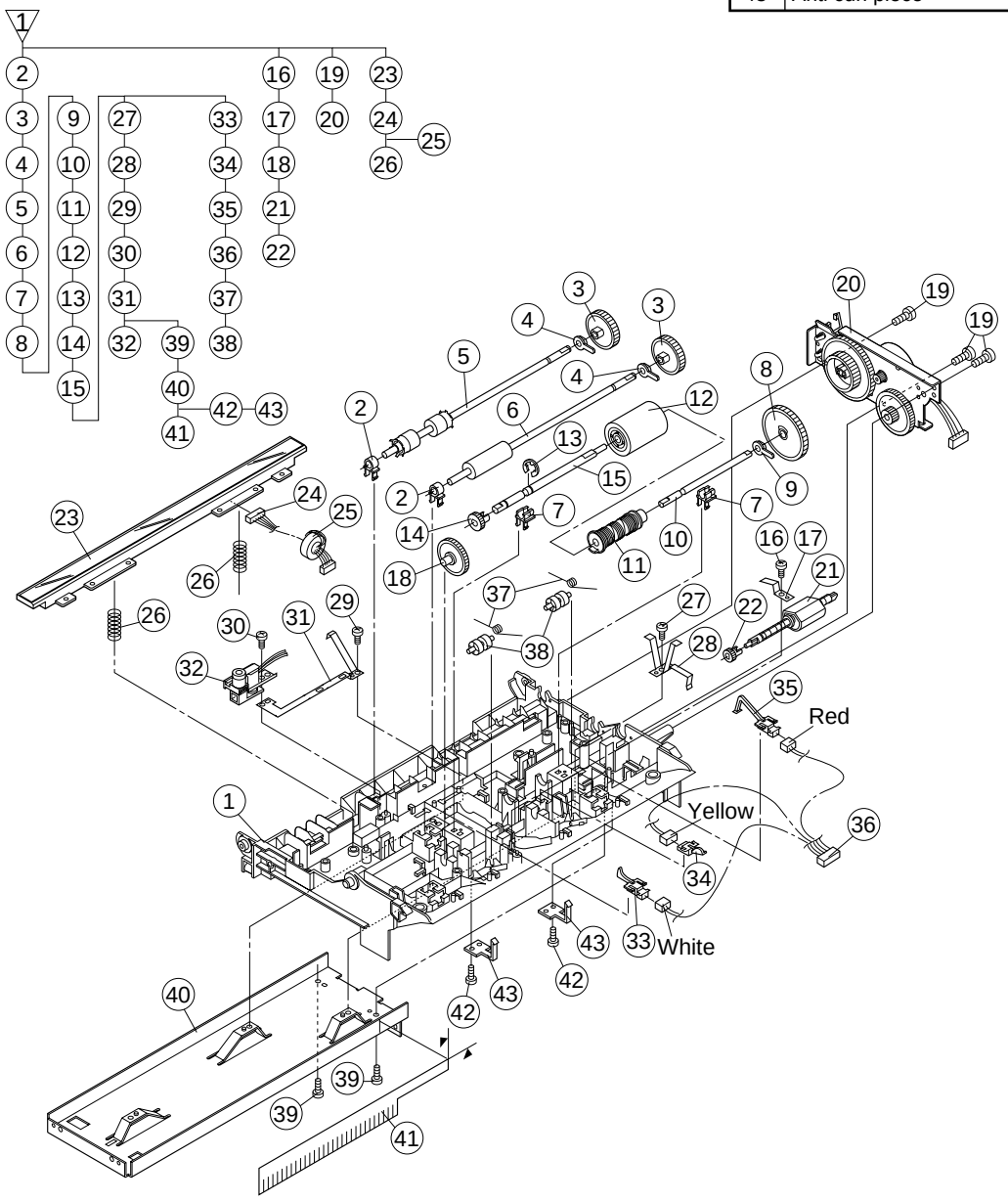


Fig. 11

12 Document guide upper unit, Operation panel unit

Parts list (Fig. 12)

No.	Part name	Q'ty	No.	Part name	Q'ty	No.	Part name	Q'ty
1	Operation panel unit	1	14	Separate gum	1	27	Screw (2×8)	9
2	Screw (3×10)	3	15	Separate sheet	1	28	Switch cover plate	1
3	Document guide upper unit	1	16	Transfer plate piece	1	29	Panel cable	1
4	Release lever	1	17	Input pressure spring	1	30	Operation panel PWB unit	1
5	Release lever spring	1	18	Back sheet	1	31	Contrast key	1
6	Screw (3×10)	2	19	Paper brush	1	32	Resolution key	1
7	Document upper plate	1	20	Back guide	1	33	Direct key	1
8	Brush earth spring	1	21	Back bracket	1	34	10 key	1
9	Separate spring	1	22	Document guide upper	1	35	Start key	1
10	Pinch roller spring 2	4	23	Screw (3x10)	1	36	Menu key	1
11	Pinch roller shaft	2	24	LCD support plate	1	37	Copy key	1
12	Pinch roller	4	25	Flat cable	2	38	Stop key	1
13	Separate plate	1	26	LCD panel unit	1	39	Page plate	1
						40	Operation panel case	1

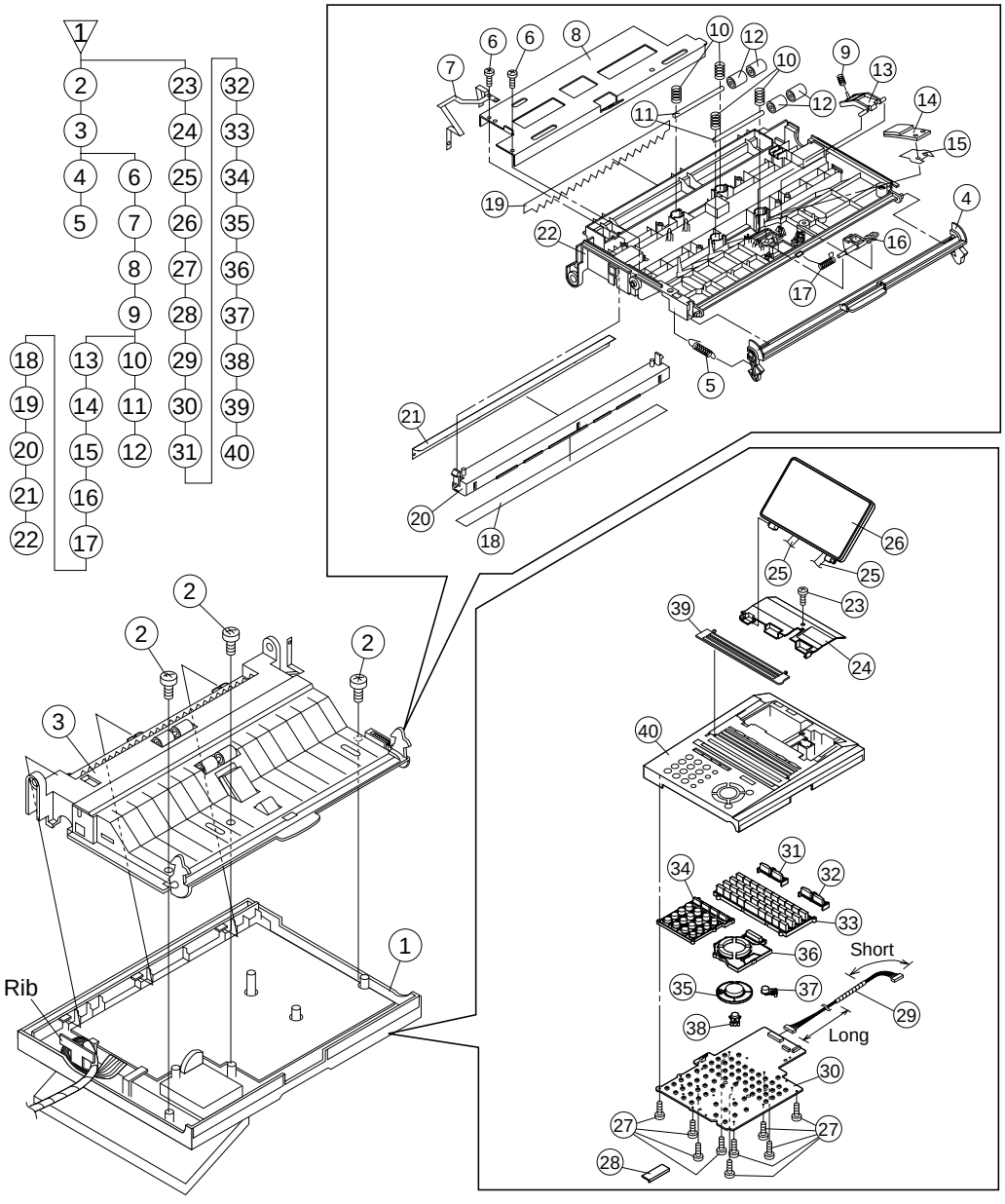


Fig. 12

13 Upper cover

Parts list (Fig. 13)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Screw (3×10)	5	13	Upper cover gear plate spring	1
2	Screw (3×8)	2			
3	Upper cover lock spring	1	14	Drum cartridge press spring	2
4	Upper cover lock nail	1	15	Paper exit guide, under	1
5	Drum cartridge detect lever spring	1	16	Paper exit guide, upper	1
			17	Pinch roller ass'y	2
6	Drum cartridge detect lever	1	18	Screw (3×8)	1
7	Shutter lever	1	19	Pinion gear	1
8	Idler gear (32z)	5	20	Hopper spring	1
9	Upper cover roller	1	21	Upper cover lock button	1
10	Idler gear 2 (17Z)	1	22	Hopper guide, left	1
11	Idler gear 1 (50Z)	1	23	Hopper guide, right	1
12	Upper cover gear plate	1	24	Upper cover	1

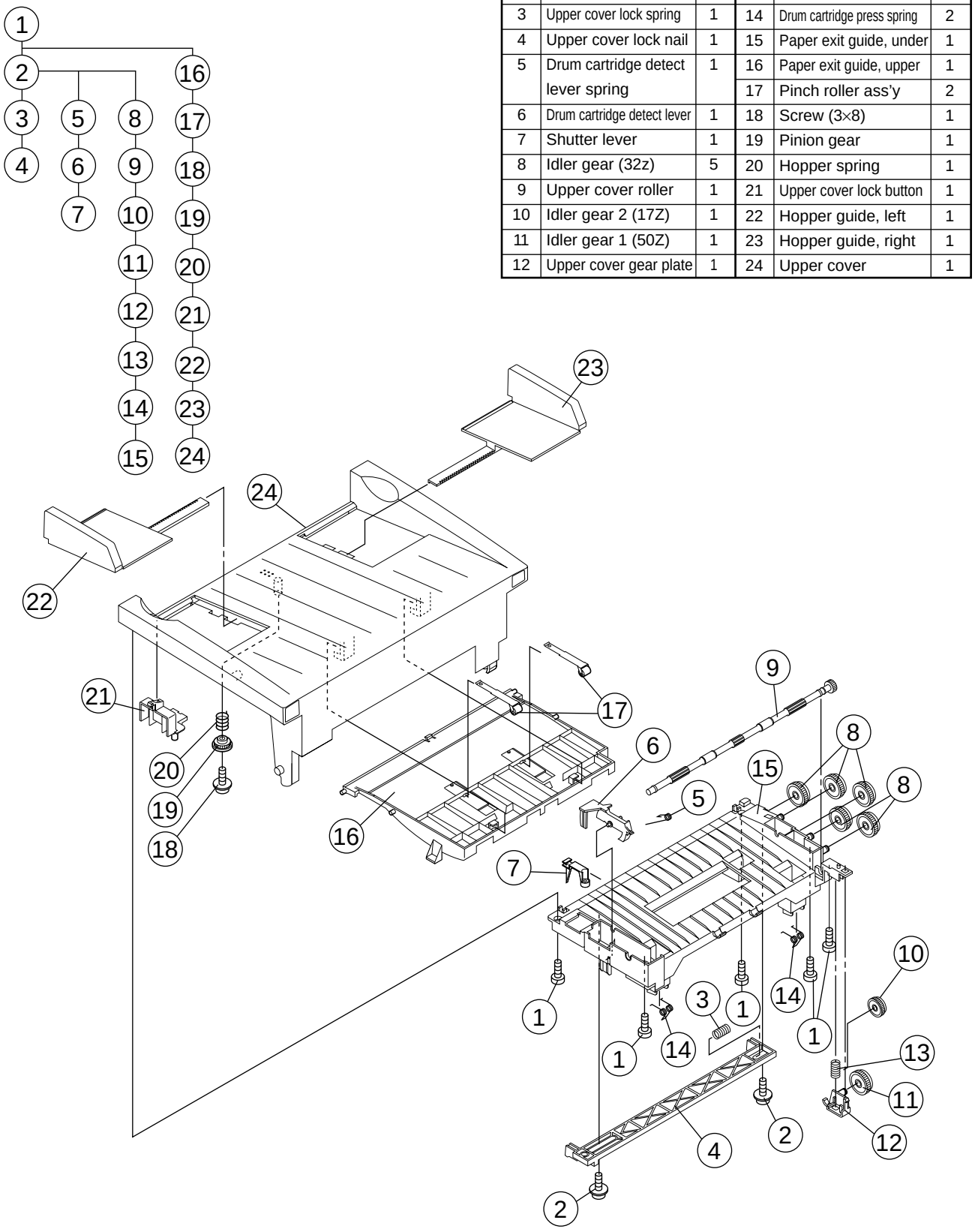


Fig. 13

14	**Wire treatment**

Parts list (Fig. 14)

No.	Part name	Q'ty
1	Band (100mm)	4
2	Core (F2125)	1
3	Core (F2124)	2
4	Band	1
5	Screw (3x10)	1

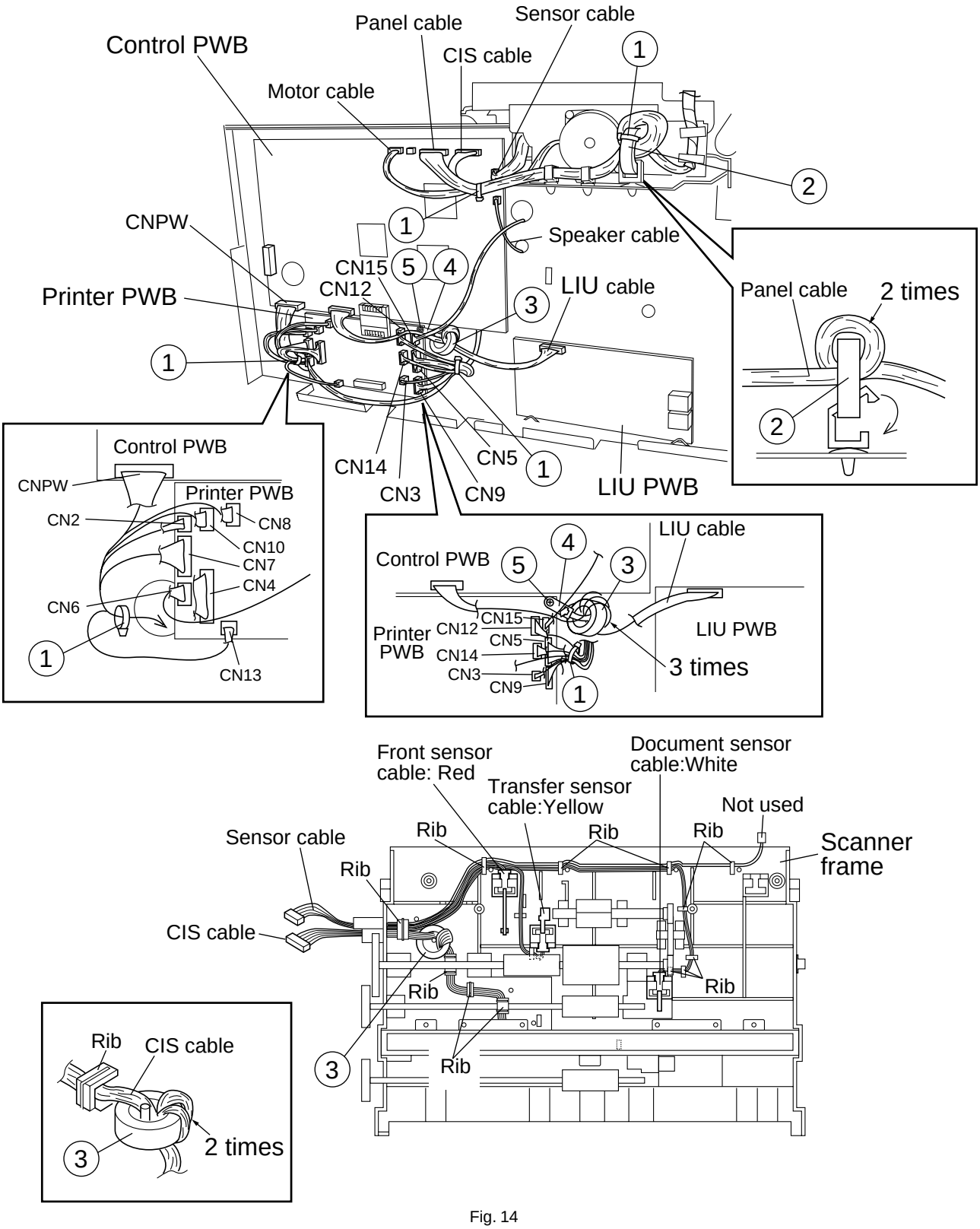
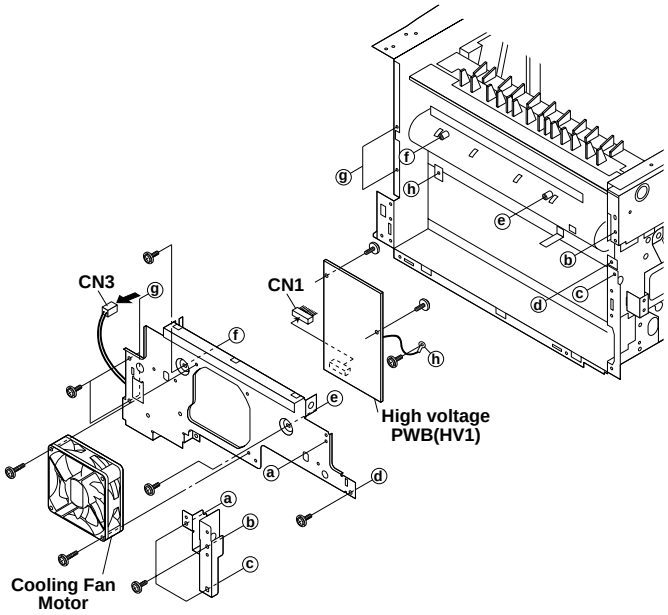
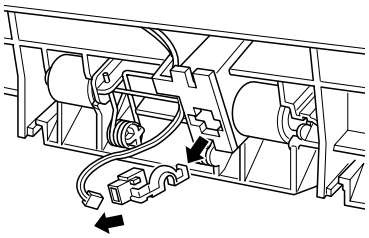


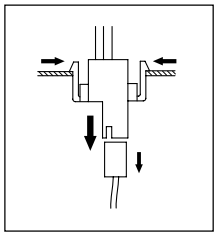
Fig. 14

15 High voltage PWB unit (HV1)



1. Remove the Cooling Fan Motor.(2 screws)
2. Remove the 2 covers. (9 screws)
3. Remove the 2 connectors.
4. Remove the High Voltage PWB.(2 screws)

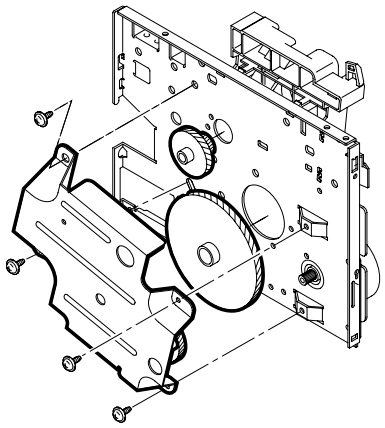




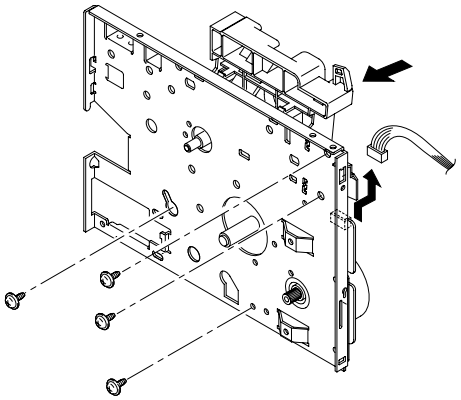
1. Remove the Paper Take-up Sensor (PS1). (1 connector)

Fig. 15

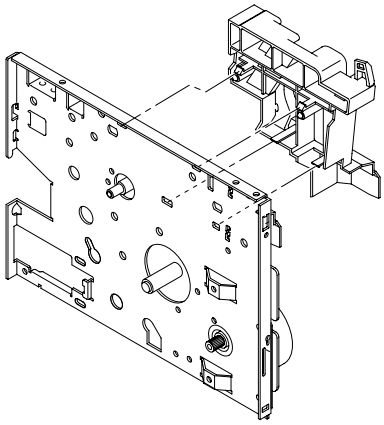
16	Main motor (M1)



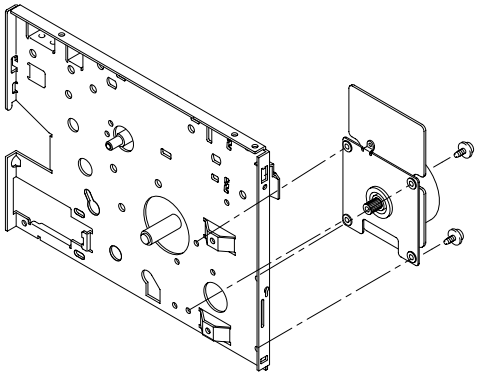
1. Remove the gear plate.(4 screws)
2. Remove 2 gears.



3. Remove the left side plate. (4 screws and 1 connector)



5. Remove the cartridge positioning plate. (Tabs at 4 places)



6. Remove the Main Motor Unit (M1). (4 screws)

Fig. 16

17 Paper take-up roller

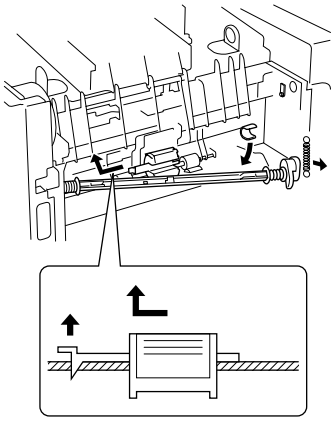


Fig. 17

1. Place the printer with its backside down.
2. Unhook the spring and remove the right-hand side of the Paper Take-up Roller shaft from its bushing.
3. Remove the Paper Take-up Roller.

18 Print head unit (PH)

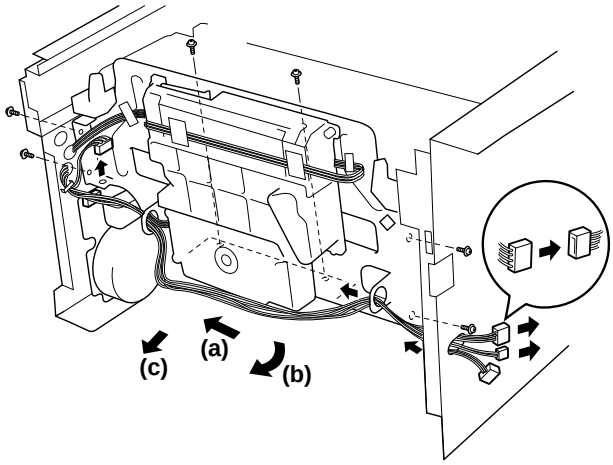


Fig. 18

1. Unplug the connector from the Main Motor Unit and remove the harness from the cord holder.
2. Unplug the connectors from the cord holder.
3. Remove the Print Head Unit (PH). (6 screws)

19 Paper empty sensor (PE1)

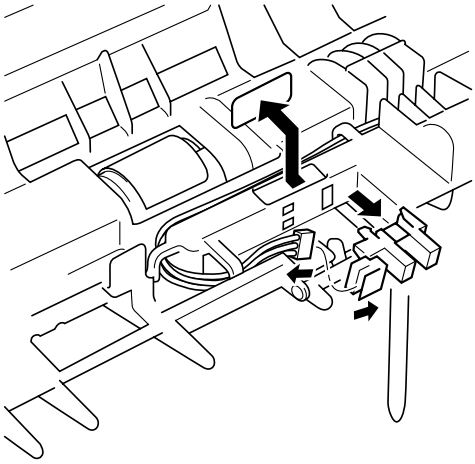
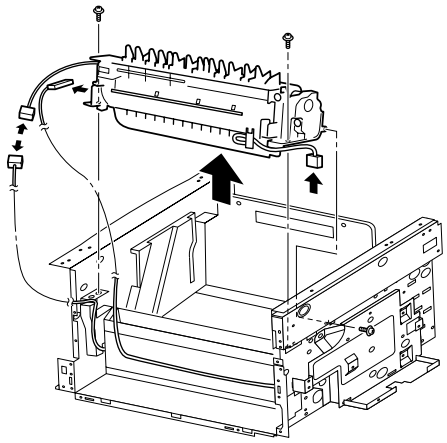


Fig. 19

1. Remove the sensor fixing bracket and remove the Paper Empty Sensor. (1 connector)

20 Fusing unit (1/2)

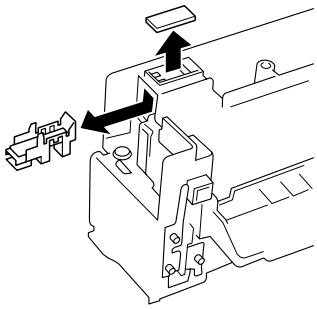


1. Remove the Fusing unit. (3 screws, 3 connectors)

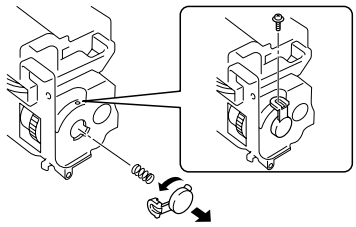
NOTE:

- **The Fusing Unit is to be replaced as a unit at about every 50,000 printed pages.**

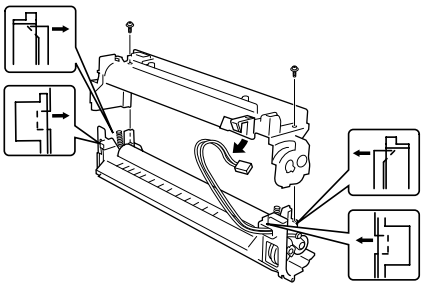
*: Use the following procedure when a part comprising the Fusing Unit is to be replaced individually to correct an image problem or the defective part.



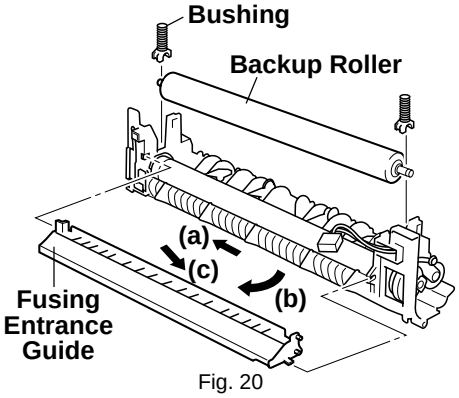
2. Remove the sensor fixing bracket and the Paper Exit Sensor (PS3).



3. Remove the Heater Lamp holding cover. (1 screw and 1 spring)



4. Remove the 2 mounting screws.
5. Pressing the right and left tabs (at 2 places), separate the upper half of the Fusing Unit from the lower half.



6. Remove the bushings and the Backup Roller.
7. Remove the Fusing Entrance Guide.

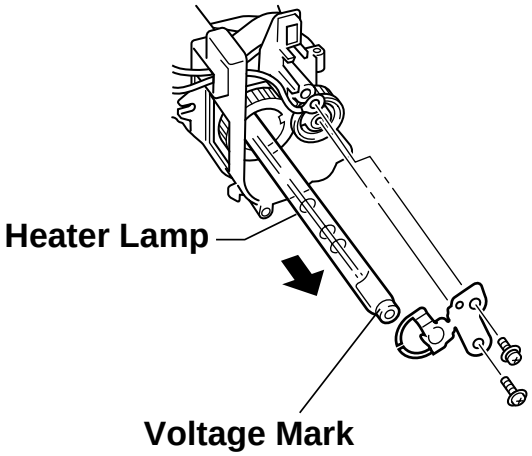
(a) Push the Fusing Entrance Guide to the left.

(b) Pull out the right end of the Fusing Entrance Guide.

(c) Pull out the left end of the Fusing Entrance Guide.

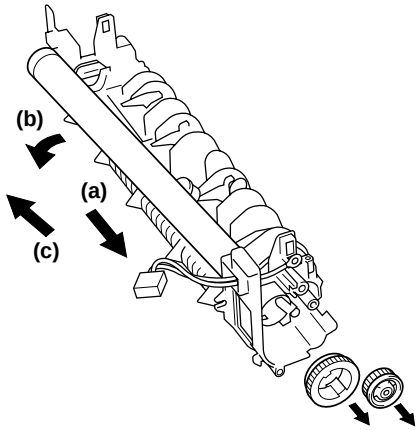
Fig. 20

21 Fusing unit (2/2)



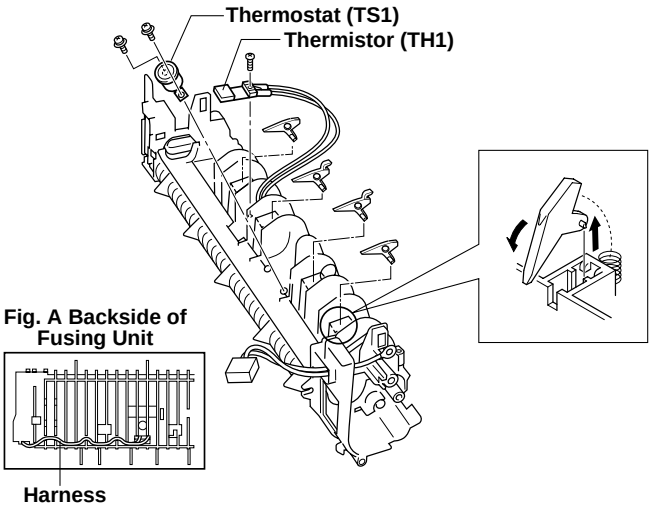
8. Remove the lamp holder. (2 screws)
9. Pull out the Heater Lamp (H1).

NOTE:
- **Use care not to touch the lamp surface with bare hands.**
- **Position the voltage mark on the gear side when reinstalling the lamp.**



10. Remove the drive gear from the Heat Roller.
11. Slide the Heat Roller to the right (a), swing out the left end (b), and then slide the roller in the direction of (c) and pull it out.

NOTE:
- **To prevent the surface of the Heat Roller from being scratched by the Fusing Separators, lift the separators when removing and reinstalling the roller. Use utmost care not to damage the surface of the roller.**



12. Remove the Fusing Paper Separators. (At 4 places)
13. Remove the Thermistor (TH1). (1 screw)

NOTE:
- **Route the harness as shown in Fig. A when reinstalling the Thermistor (TH1).**

14. Remove the Thermostat (TS1). (2 screws)

Fig. 21

22 Paper cassette (FO-CS1)

Parts list (Fig. 22)

No.	Part name	Q'ty
1	Paper cassette ass'y	1
2	Screw (3×10)	3
3	Screw (3×10)	4
4	Screw (3×6)	1
5	Screw (3×12)	1
6	Bottom plate	1

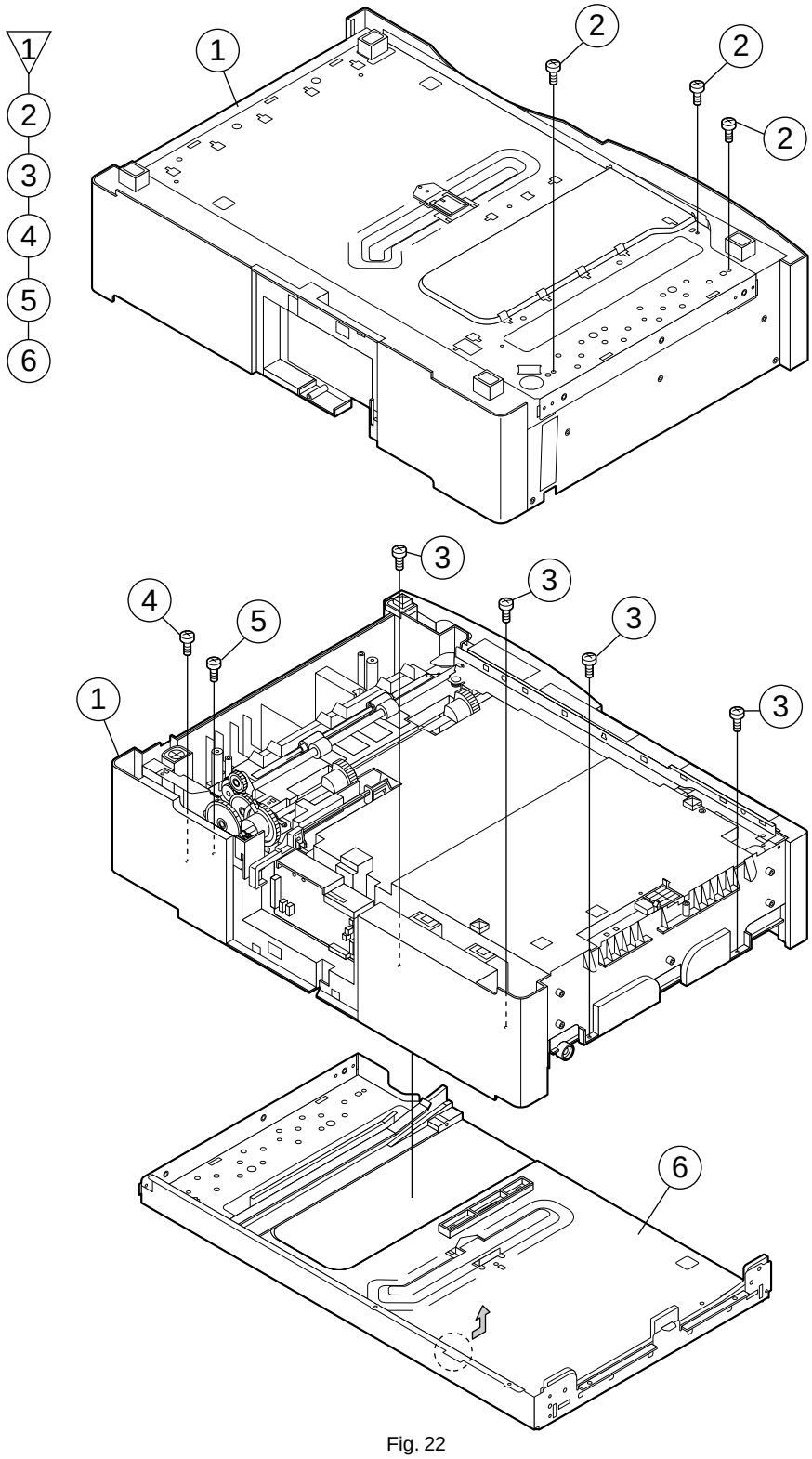


Fig. 22

23	**Cassette case unit, Option cassette PWB unit (FO-CS1)**

Parts list (Fig. 23)

No.	Part name	Q'ty
1	Cassette cabinet unit	1
2	Cassette case unit	1
3	Paper sensor lever	1
4	Sensor guide plate	1
5	Connector	4
6	Screw (3×10)	2
7	Cassette PWB unit	1

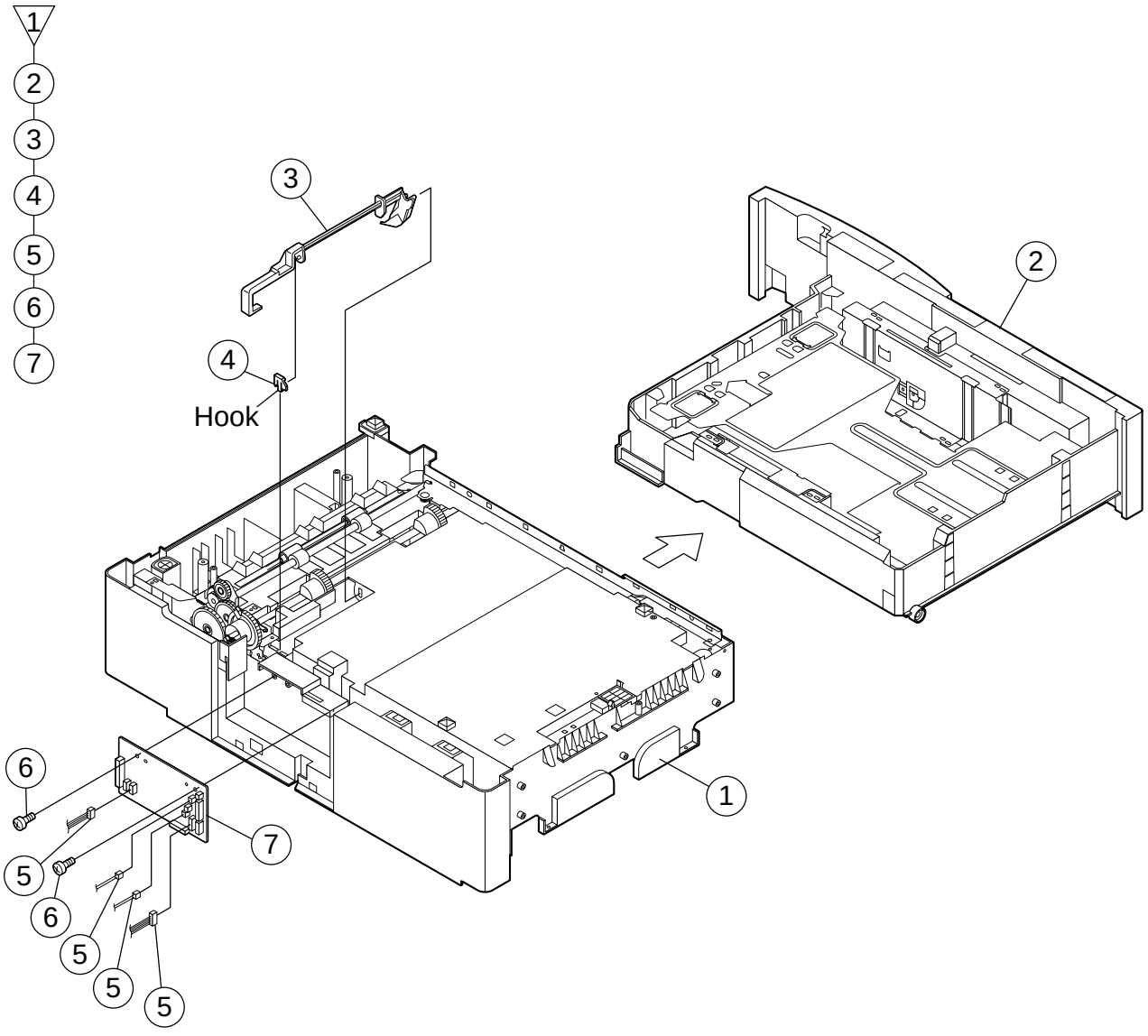


Fig. 23

24 Drive system unit (FO-CS1)

Parts list (Fig. 24)

No.	Part name	Q'ty
1	Cassette cabinet unit	1
2	Screw (3×8)	1
3	Screw (3×10)	1
4	Screw (3×10)	1
5	Front support bracket	1
6	Screw (3×10)	3
7	Clutch spring	1
8	Paper feed clutch gear	1
9	PU roller bearing	1
10	PU roller unit/Cassette up roller shaft	1
11	Drive roller	1
12	Drive roller bearing	1
13	Drive system unit	1
14	Cassette size sensor	1
15	Screw (3x8)	2
16	Paper size sensor	1

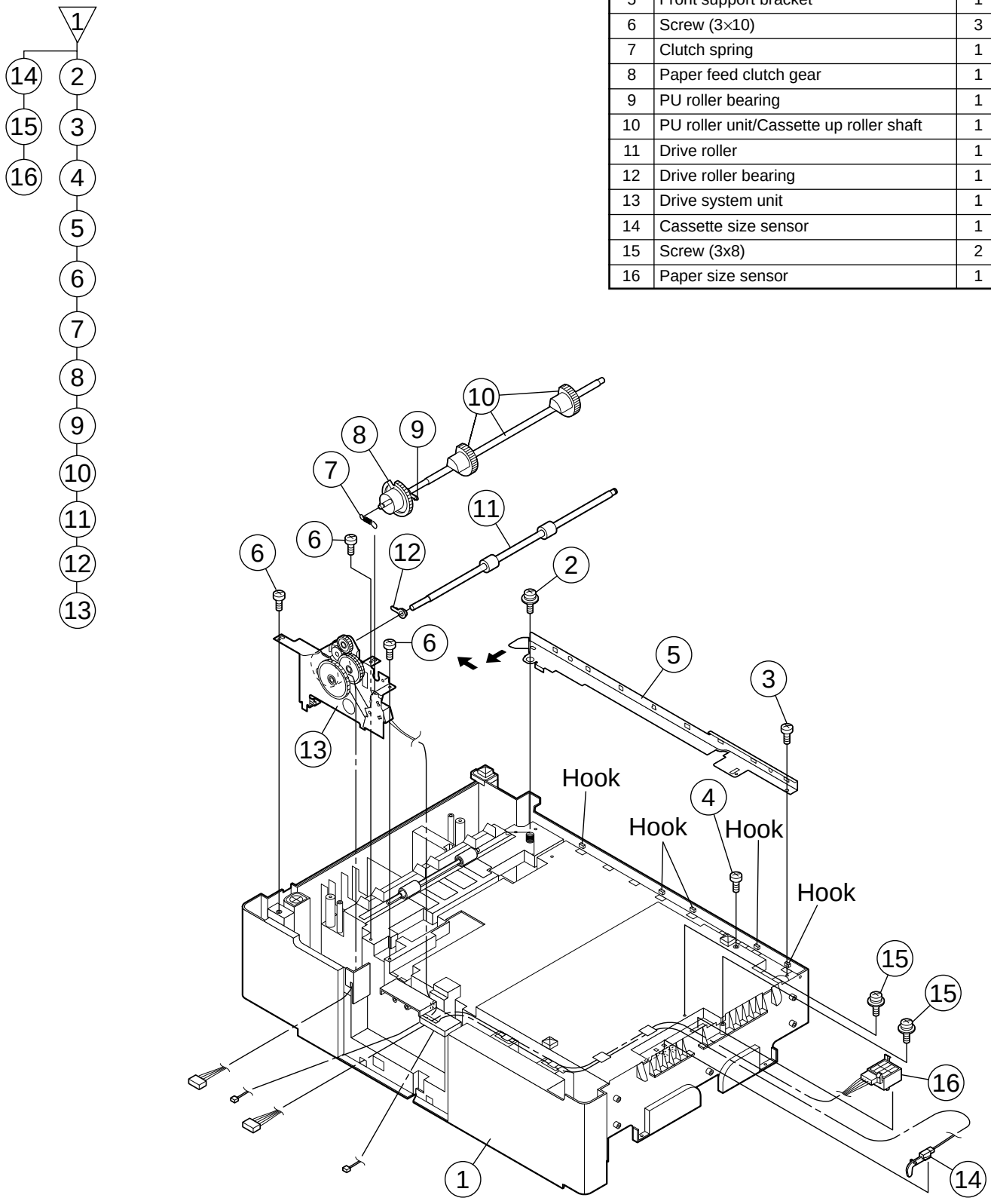


Fig. 24

25 Cassette cabinet (FO-CS1)

Parts list (Fig. 25)

No.	Part name	Q'ty
1	Cassette cabinet unit	1
2	Screw (3×10)	2
3	Cassette paper guide	1
4	Idler gear	1
5	Earth spring	1
6	Lever joint 1	1
7	Pinch roller	2
8	Pinch roller shaft	1
9	Pinch roller spring	2
10	Release lever spring	1
11	Lever joint 2	1
12	Release lever/Gear plate	1
13	Release shaft	1
14	Cassette cabinet	1

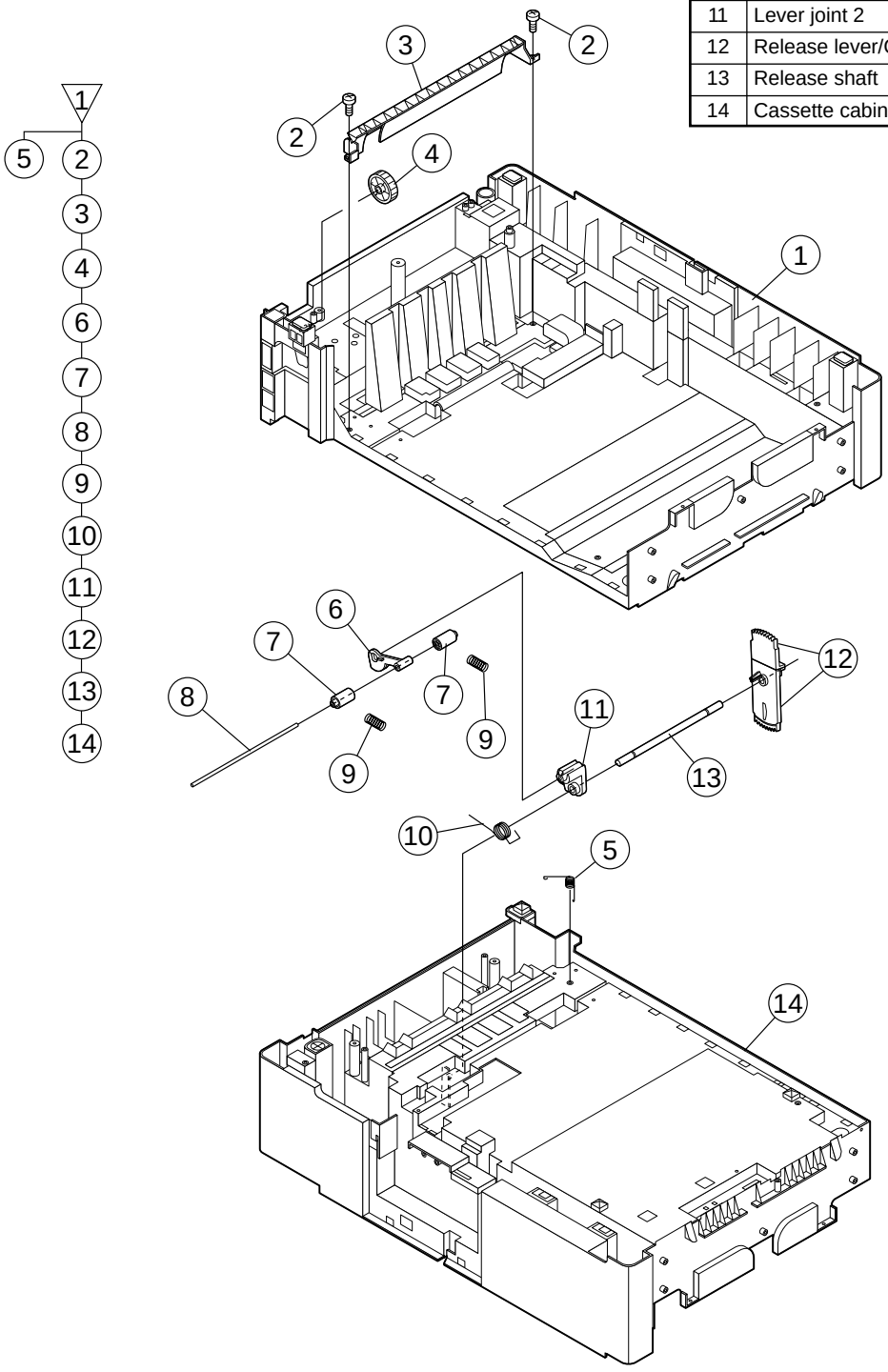
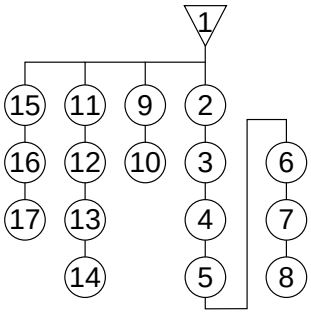


Fig. 25

26 Cassette case (1/2) (FO-CS1)

Parts list (Fig. 26)

No.	Part name	Q'ty
1	Cassette case unit	1
2	Screw (3×10)	2
3	Cassette push up plate holder	2
4	Screw (3×10)	2
5	Cassette back guide plate	1
6	Cassette back guide	1
7	Cassette push up plate	1
8	Cassette push up plate spring	2
9	Screw (Special)	2
10	Slide roller	2
11	Screw (3x10)	2
12	Lock down spring 2	1
13	Lock down piece 2	1
14	Lock down holder	1
15	Screw (3x8)	1
16	Lock down spring	1
17	Lock down piece 1	1



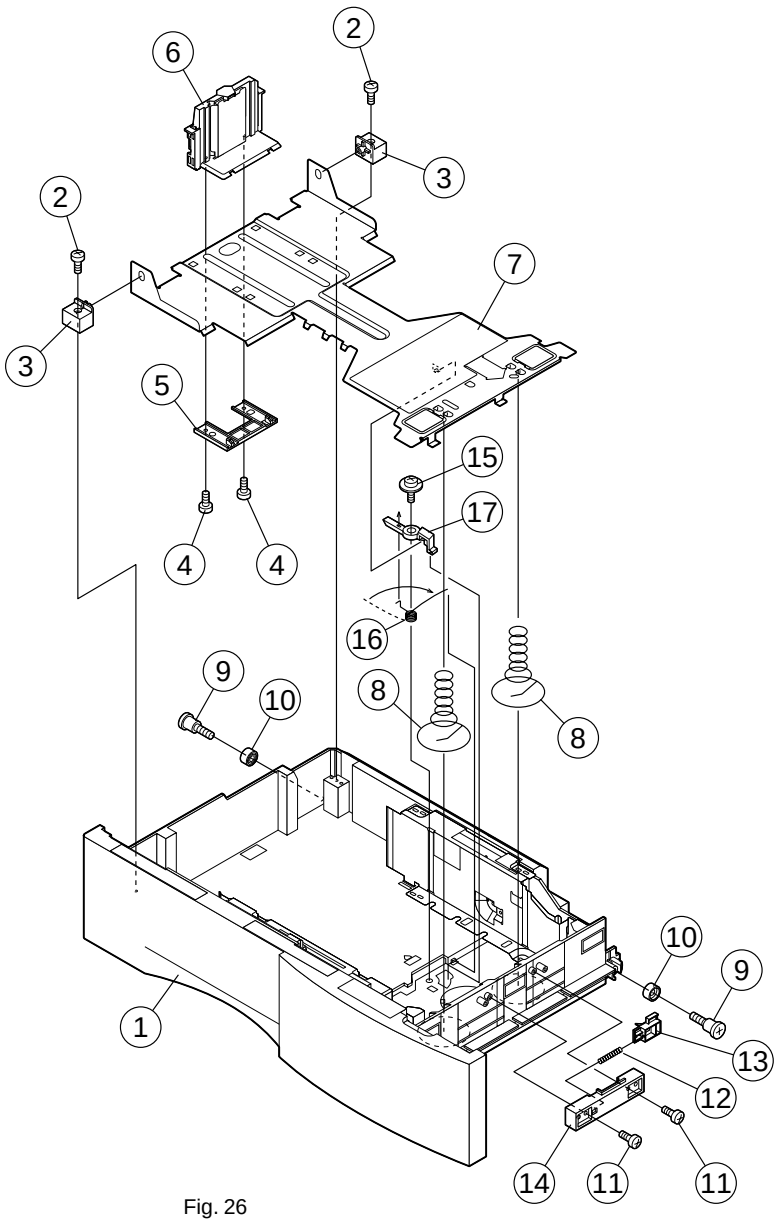


Fig. 26

27 Cassette case (2/2) (FO-CS1)

Parts list (Fig. 27)

No.	Part name	Q'ty
1	Cassette case unit	1
2	Screw (3×10)	4
3	Cassette width guide/separate nail, front	1
4	Screw (3×10)	4
5	Cassette width guide/separate nail, rear	1

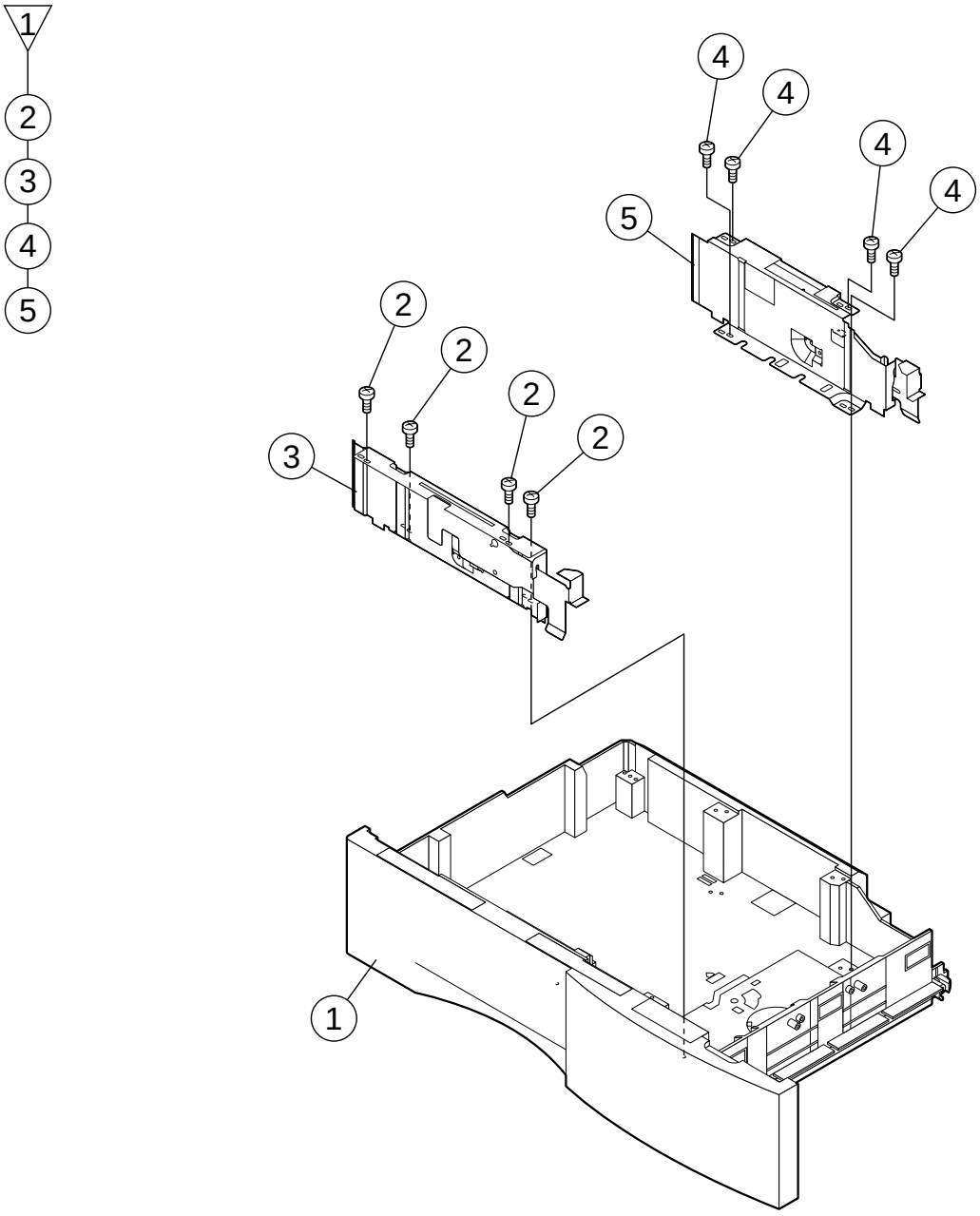
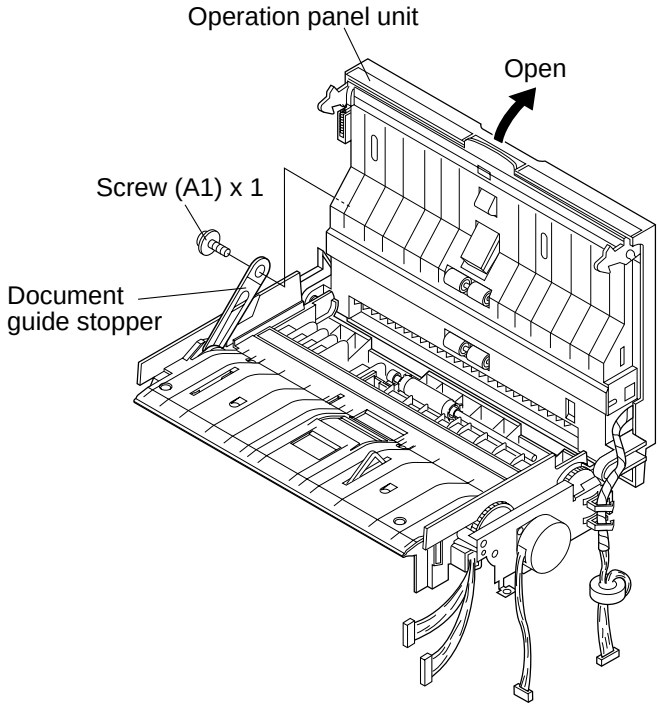


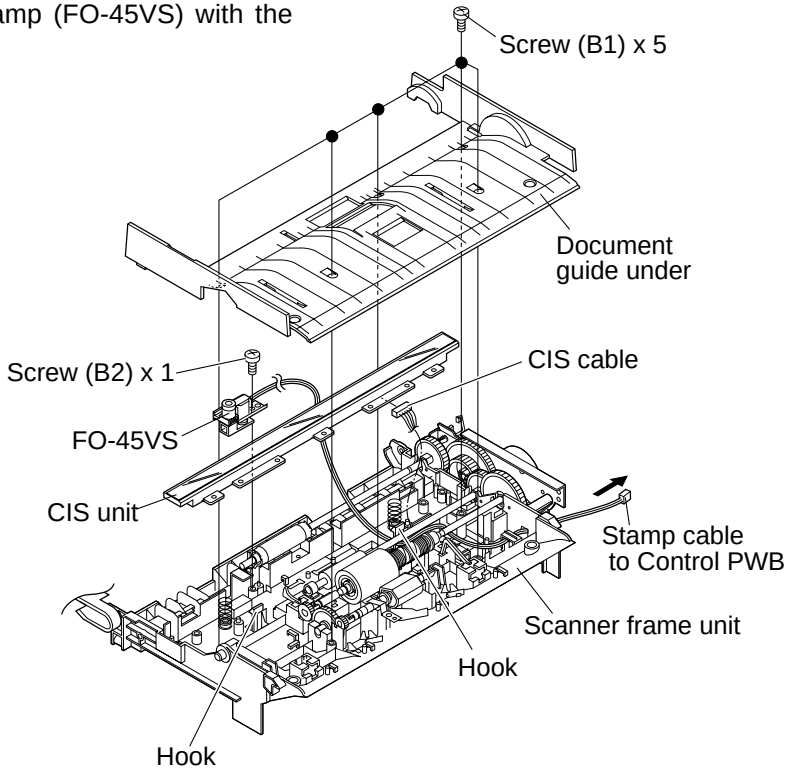
Fig. 27

[4] How to install the verification stamp (FO-45VS)

1. Open the operation panel unit.
2. Remove the screw (A1) x 1 pc. and open the operation panel more widely.



3. Remove the screws (B1) x 5 pcs., to remove document guide under.
4. Remove CIS unit
   Carefully bend 2 hooks and remove CIS cable.
5. Install the verification stamp (FO-45VS) with the screw (B2) x 1pc.



6. Wire treatment
   Stamp cable must be passed through six ribs as shown in fig.1.
   Connect the stamp cable to CNSTP (2 pin) of control PWB

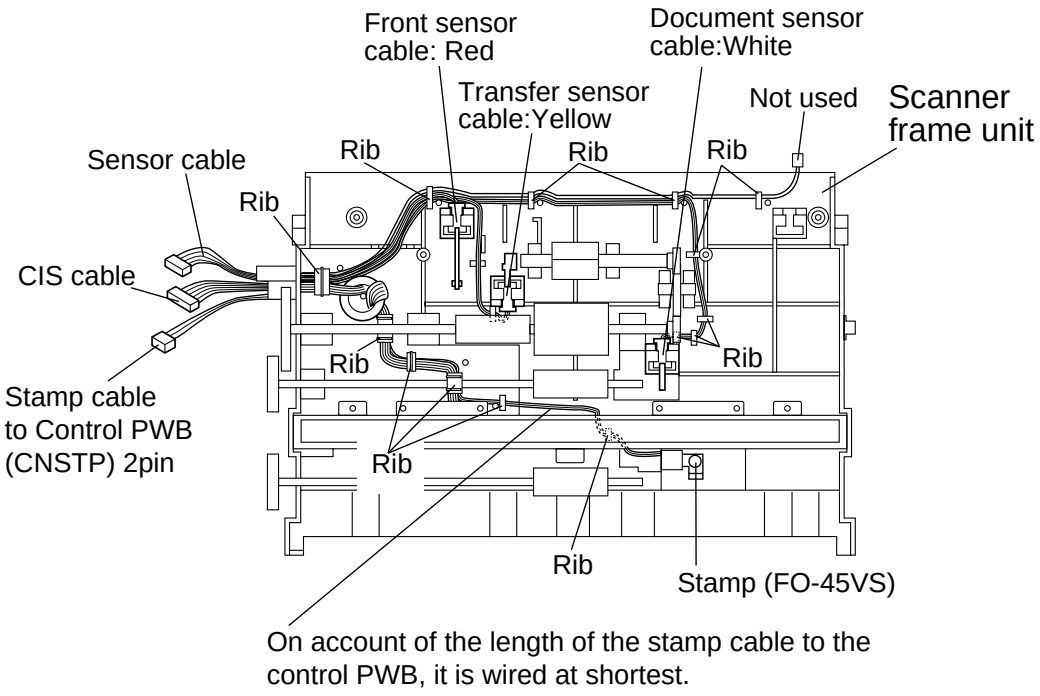


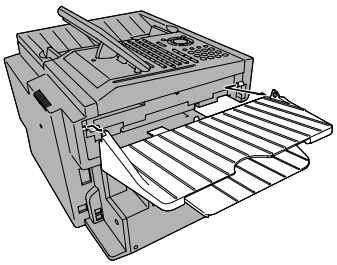
Fig. 1

7. Soft switch setting
   When you install the verification stamp (FO-45VS), set the soft SW 27. No. 3 initial setting to "1".

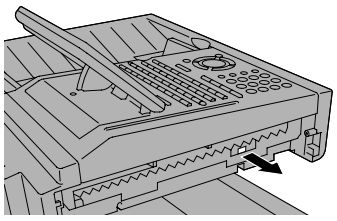
8. Replacing the verification stamp

   If you are using the Verification Stamp function, you will need to replace the ink cartridge in the stamp unit when it runs out of ink (when the stamped mark on original documents becomes faint). A new ink cartridge can be obtained from your dealer.

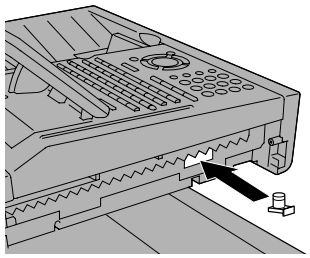
   ① Remove the original document OUT tray.



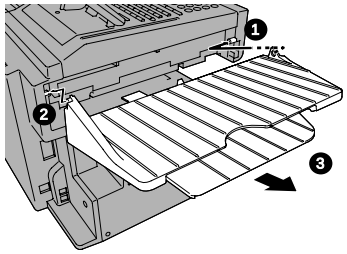
   ② Press down on the protruding tab of the green ink cartridge and pull the cartridge out with your fingers.



   ③ Insert the new ink cartridge into the machine (make sure that the tab is facing out).



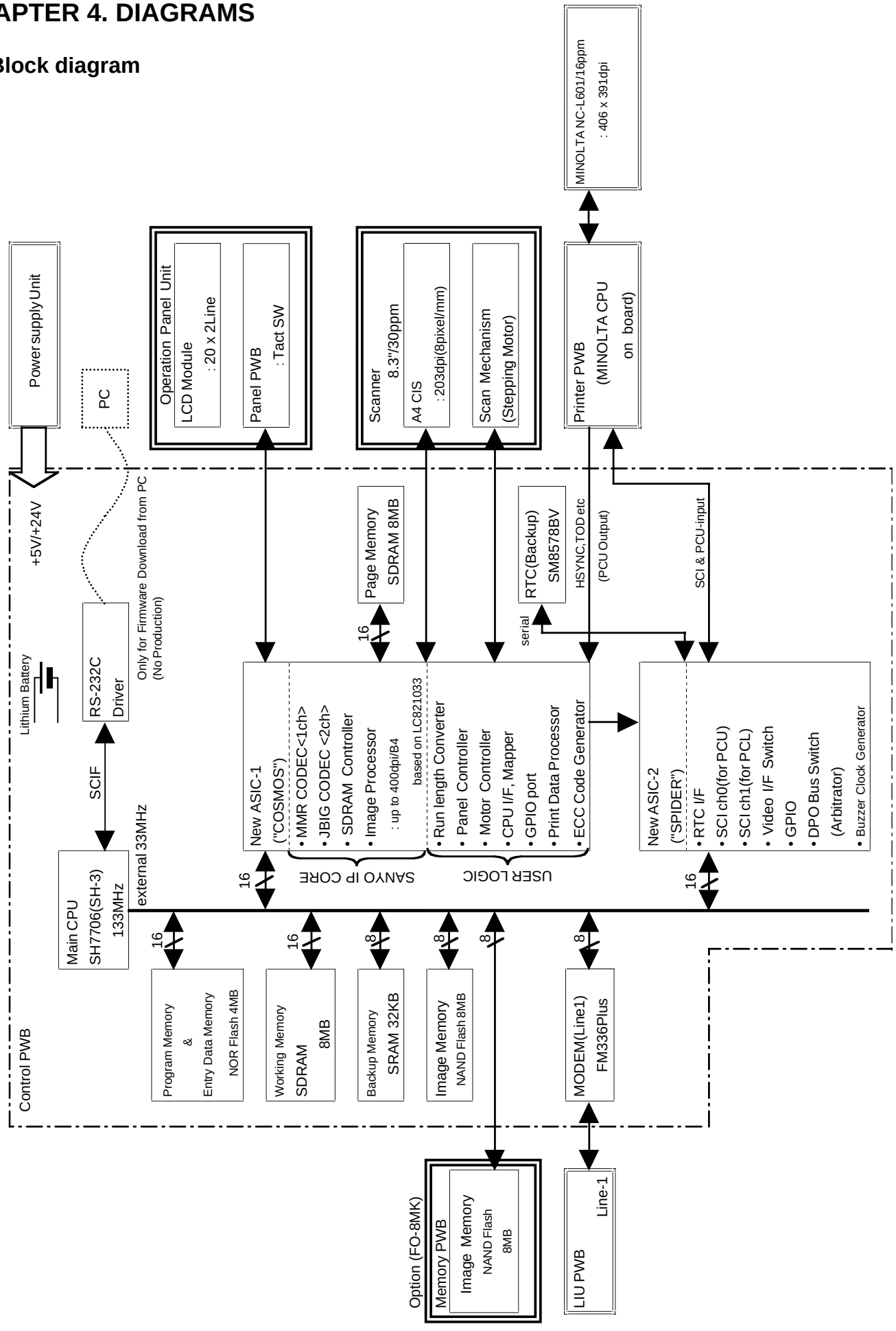
   ④ Replace the original document OUT tray.



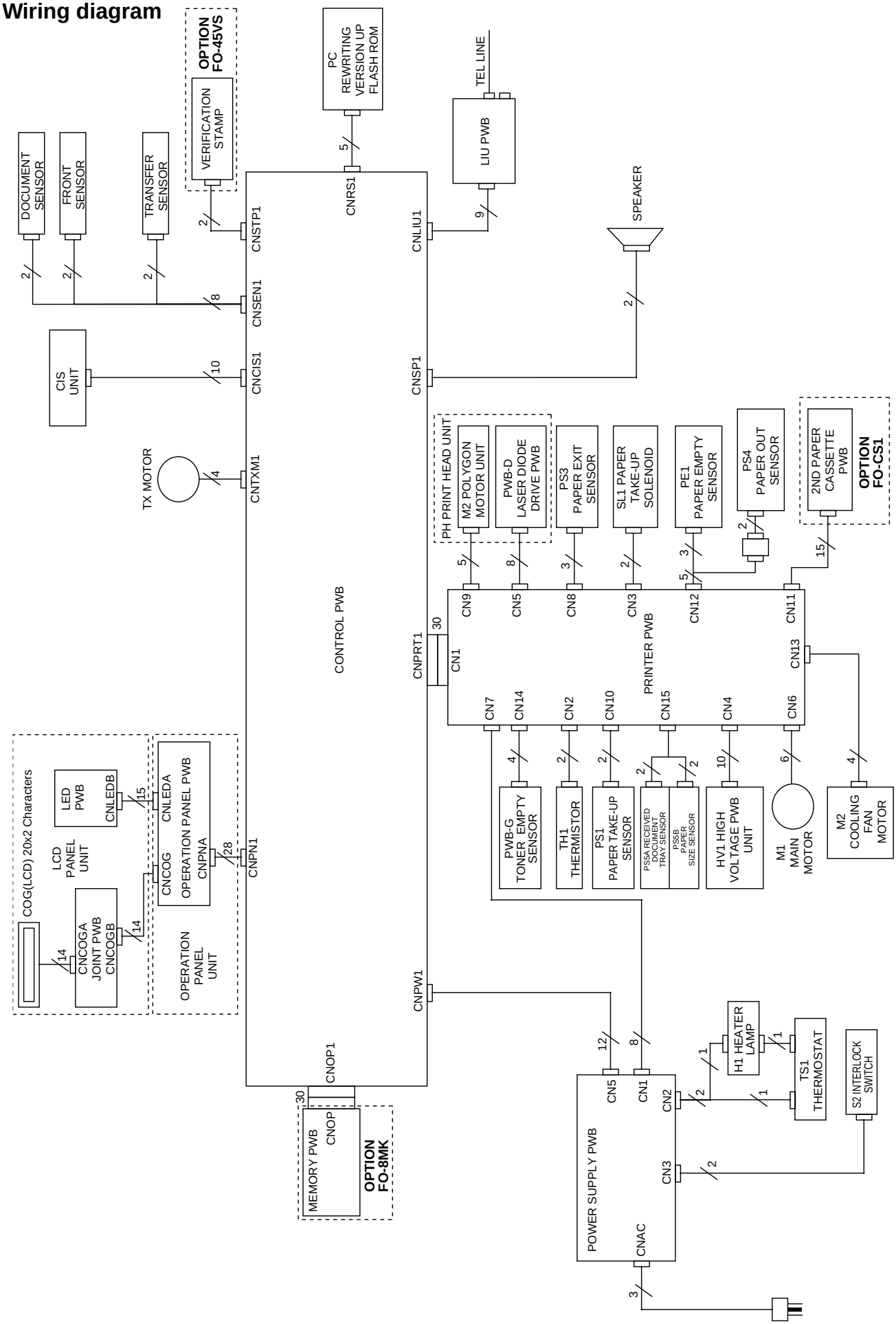
Stamp (Ink cartridge) only (20 pieces)
Parts code : **UINK-2009SC01**

CHAPTER 4. DIAGRAMS

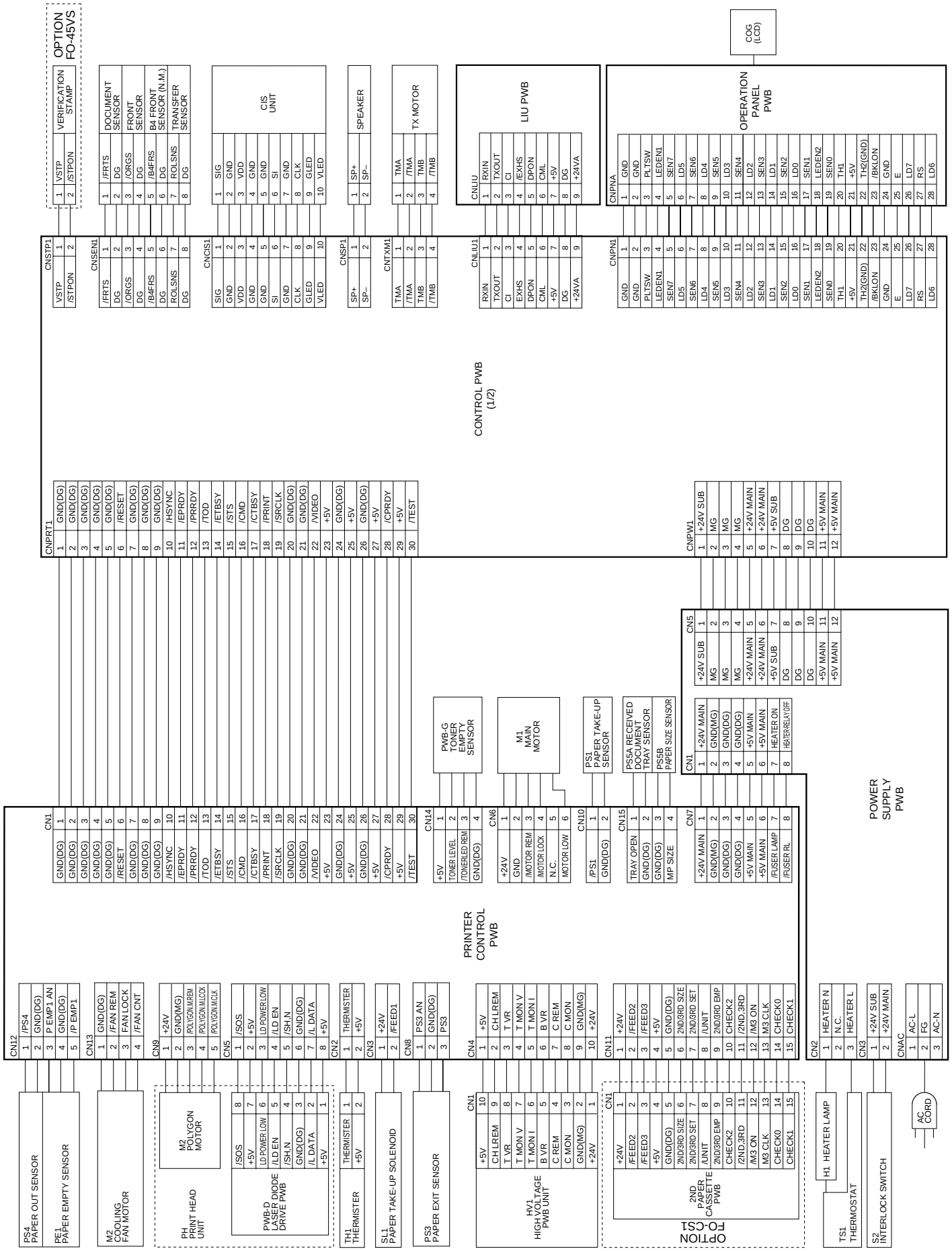
[1] Block diagram



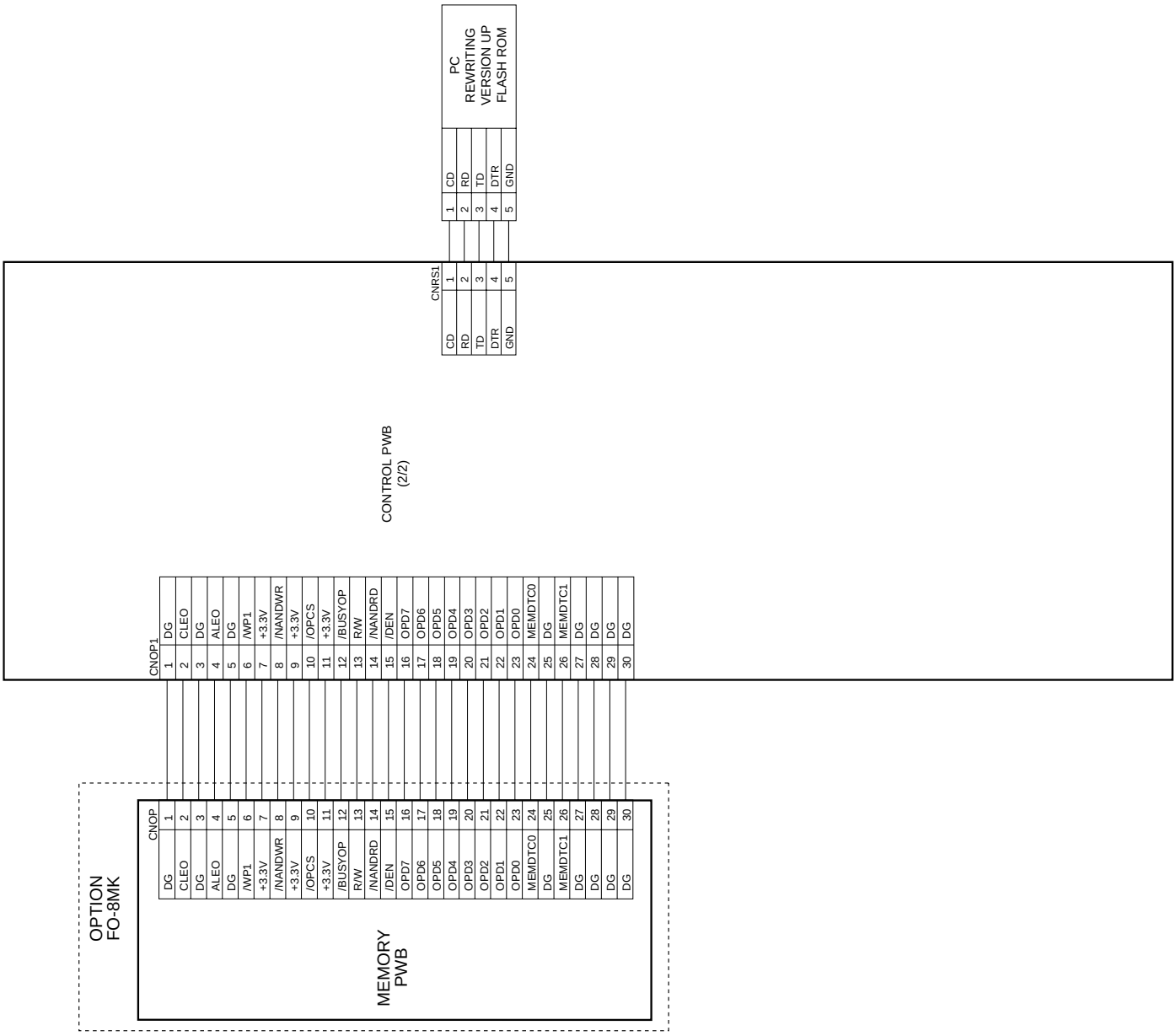
[2] Wiring diagram



[3] Point- to-point diagram and connector signal name (1)



Point- to-point diagram and connector signal name (2)



CHAPTER 5. CIRCUIT DESCRIPTION

[1] Circuit description

1. General description

In this machine, the facsimile control block except the printer control is mainly composed of the units shown in Fig. 1.

2. PWB configuration

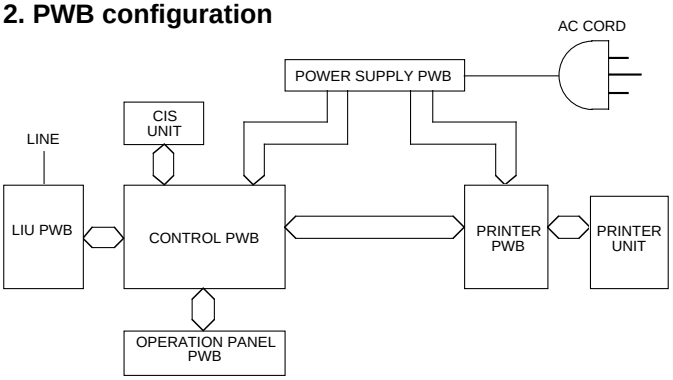


Fig. 1

1) Control PWB

The control PWB controls all the other operations except the printing operation of the printer.

2) CIS unit

CIS UNIT converts the image of the sending or copying draft into the photoelectric signals and transmits the signals to the control PWB.

3) LIU PWB

The LIU PWB controls the I/F telephone function of the circuit with the control signals from the control PWB.

4) Operation panel PWB

The operation panel PWB detects the key input, turns on and off LED and displays LCD according to the control signals from the control PWB.

5) Power supply PWB

DC voltages (+5V, +24V) are produced from AC120V, and are supplied to the printer unit and control PWB unit.

[2] Circuit description of control PWB

1. General description

The control PWB is composed of the following blocks.

(1) Main control block
(2) Backup memory block
(3) Modem block
(4) Scanner control block
(5) Speaker amplifier
(6) Page memory block
(7) Drive block

2. Description of each block

(1) Main control block

This block consists of 32 bit RISC microcomputer HD6417706F133 (main component), flash ROM, 64 Mbit SDRAM, Main ASIC, Sub ASIC, etc. Each device is controlled either by the microcomputer directly or via Main ASIC.

1) HD6417706F133 (IC24): pin-176, QFP (main CPU)

This is a microcomputer with a core of 32 bit RISC (Reduced Instructions Set Computer) CPU, which periphery functions are integrated into. This device is equipped with the following function. The clock inputs 33.1776 MHz from outside and operates at 4-times frequency (approx. 133 MHz) internally.

Feature

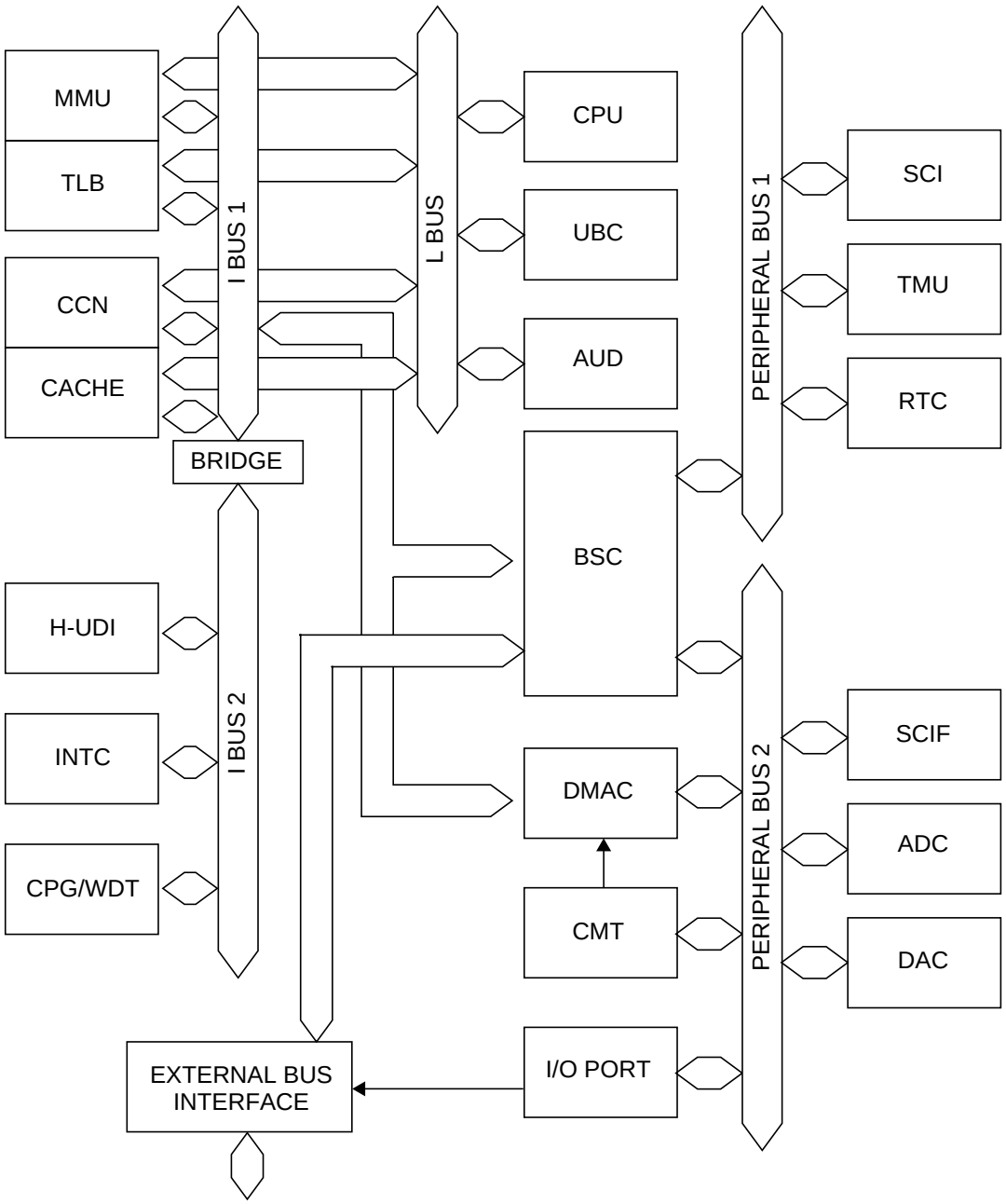
· Original Hitachi SuperH architecture
· Object code level compatible with SH-1, SH-2 and SH-3
· 32-bit RISC-type instruction set
  — Instruction length: 16-bit fixed length
  — Improved code efficiency
  — Load-store architecture
  — Delayed branch instructions
  — Instruction set oriented for C language
· Five-stage pipeline
· Instruction execution time: one instruction/cycle for basic instructions
· General-register: Sixteen 32-bit general registers
· Control-register: Eight 32-bit control registers
· System-register: Four 32-bit system registers
· 32-bit internal data bus
· Logical address space: 4 Gbytes
· Space indentifier ASID: 8 bits, 256 logical address space
· Abundant Peripheral Functions
  — Memory Management Unit (MMU)
  — User Break Controller (UBC)
  — Bus state Controller (BSC)
  — Direct Memory Access Controller (DMAC)
  — Clock Pulse Generator (CPG)
  — Watchdog Timer (WDT)
  — Timer Unit (TMU)
  — Realtime Clock (RTC)
  — Serial Communication Interface (SCI)
  — Smartcard Interface
  — Serial Communication Interface with FIFO (SCIF)
  — 10-bitits A/D converter (ADC)
  — 8-bitit D/A converter (DAC)
  — Hitachi User Debugging Interface (H-UDI)
  — Advanced User Debugger (AUD)

2) LH28F320BFHE-PBTLZA (IC12): pin-48, TSOP (32 Mbit FLASH MEMORY)

This is a flash memory writing program and is also used for the registration data, such as telephone directory.
32 Mbit area is divided into 2 for every 16 Mbit; the lower-order and higher-order address sides are used for the program and for the registration data, respectively.

3) W986416DH or MT48LC4M16A2TG (IC25): pin-54, TSOP (64 Mbit SDRAM)

The program stored in the flash memory (IC12) mentioned in the above item 2) is downloaded to this SDRAM and used as a program execution memory. It is also used as various work memories and communication buffers. The devices manufactured by 2 enterprises are acknowledged. (Former model No.: manufactured by WINBOND, later model No.: manufactured by MICRON)



Legend:

ADC:	A/D converter
AUD:	Advanced user debugger
BSC:	Bus state controller
CACHE:	Cache memory
CCN:	Cache memory controller
CMT:	Compare match timer
CPG/WDT:	Clock pulse generator/watchdog timer
CPU:	Central processing unit
DAC:	D/A converter
DMAC:	Direct memory access controller
H-UDI:	Hitachi user-debugging interface
INTC:	Interrupt controller
MMU:	Memory management unit
RTC:	Realtime clock
SCI:	Serial communication interface (with smart card interface)
SCIF:	Serial communication interface (with FIFO)
TLB:	Address translation buffer
TMU:	Timer unit
UBC:	User break controller

Fig. 2 HD6417706F133 BLOCK DIAGRAM

HD6417706F133 (IC24) Terminal description (1/2)

PIN	I/O	Name	Function	PIN	I/O	Name	Function
1	—	Vcc-RTC*1	RTC power supply (1.9 V)	52	O	A5	Address bus
2	O	XTAL2	On-chip RTC crystal oscillator pin	53	O	A6	Address bus
3	I	EXTAL2	On-chip RTC crystal oscillator pin	54	O	A7	Address bus
4	—	Vss-RTC*1	RTC power supply (0 V)	55	O	A8	Address bus
5	I/O	D31/PTB[7]	Data bus/input/output port B	56	O	A9	Address bus
6	I/O	D30/PTB[6]	Data bus/input/output port B	57	O	A10	Address bus
7	I/O	D29/PTB[5]	Data bus/input/output port B	58	O	A11	Address bus
8	I/O	D28/PTB[4]	Data bus/input/output port B	59	O	A12	Address bus
9	I/O	D27/PTB[3]	Data bus/input/output port B	60	O	A13	Address bus
10	I/O	D26/PTB[2]	Data bus/input/output port B	61	—	VssQ	Input/output power supply (0 V)
11	—	VssQ	Input/output power supply (0 V)	62	O	A14	Address bus
12	I/O	D25/PTB[1]	Data bus/input/output port B	63	—	VccQ	Input/output power supply (3.3 V)
13	—	VccQ	Input/output power supply (3.3 V)	64	O	A15	Address bus
14	I/O	D24/PTB[0]	Data bus/input/output port B	65	O	A16	Address bus
15	I/O	D23/PTA[7]	Data bus/input/output port A	66	O	A17	Address bus
16	I/O	D22/PTA[6]	Data bus/input/output port A	67	O	A18	Address bus
17	I/O	D21/PTA[5]	Data bus/input/output port A	68	O	A19	Address bus
18	I/O	D20/PTA[4]	Data bus/input/output port A	69	O	A20	Address bus
19	—	Vss	Internal power supply (0 V)	70	O	A21	Address bus
20	I/O	D19/PTA[3]	Data bus/input/output port A	71	—	Vss	Internal power supply (0 V)
21	—	Vcc	Internal power supply (1.9 V)	72	O	A22	Address bus
22	I/O	D18/PTA[2]	Data bus/input/output port A	73	—	Vcc	Internal power supply (1.9 V)
23	I/O	D17/PTA[1]	Data bus/input/output port A	74	O	A23	Address bus
24	I/O	D16/PTA[0]	Data bus/input/output port A	75	O	A24	Address bus
25	—	VssQ	Input/output power supply (0 V)	76	O	A25	Address bus
26	I/O	D15	Data bus	77	O/ I/O	BS-/PTC[0]	Bus cycle start signal/ input/output port C
27	—	VccQ	Input/output power supply (3.3 V)	78	O	RD-	Read strobe
28	I/O	D14	Data bus	79	O	WE-/DQMLL-	D7-D0 select signal/ DQM (SDRAM)
29	I/O	D13	Data bus	80	O	WE1-/DQMLU-/WE-	D15-D8 select signal/DQM (SDRAM)/write strobe (PCMCIA)
30	I/O	D12	Data bus	81	O/O/O/I/O	WE2-/DQMUL-/ICIORD/PTC[1]	D23-D16 select signal/DQM (SDRAM)/PCMCIA
31	I/O	D11	Data bus				input/output read/ input/output port C
32	I/O	D10	Data bus	82	O/O/O/I/O	WE2-/DQMUU-/ICIOWR/PTC[2]	D31-D24 select signal/DQM (SDRAM)/PCMCIA
33	I/O	D9	Data bus				input/output write/ input/output port C
34	I/O	D8	Data bus	83	O	RD/WR-	Read/write
35	I/O	D7	Data bus	84	—	VssQ	Input/output power supply (0 V)
36	I/O	D6	Data bus	85	O	CS0-	Chip select
37	—	VssQ	Input/output power supply (0 V)	86	—	VccQ	Input/output power supply (3.3 V)
38	I/O	D5	Data bus	87	O /I/O	CS2-/PTC[3]	Chip select 2/input/output port C
39	—	VccQ	Input/output power supply (3.3 V)	88	O /I/O	CS3-/PTC[4]	Chip select 3/input/output port C
40	I/O	D4	Data bus	89	O /I/O	CS4-/PTC[5]	Chip select 4/input/output port C
41	I/O	D3	Data bus	90	O/O/I/O	CS5-/CE1A/PTC[6]	Chip select 5/CE1 (area 5 PCMCIA)/input/output port C
42	I/O	D2	Data bus	91	O/O/I/O	CS6-/CE1B/PTC[7]	Chip select 6/CE1 (area 6 PCMCIA)/input/output port C
43	I/O	D1	Data bus	92	O/ I/O	CE2A-/PTD[6]	Area 5 PCMCIA CE2/ input/output port D
44	I/O	D0	Data bus	93	—	VssQ	Input/output power supply (0 V)
45	O	A0	Address bus	94	O/ I/O	CE2B-/PTD[7]	Area 6 PCMCIA CE2/ input/output port D
46	O	A1	Address bus	95	—	VccQ	Input/output power supply (3.3 V)
47	O	A2	Address bus	96	O/ I/O	RASL-/PTD[0]	Lower 32 Mbytes address RAS(SDRAM)/input output port D
48	O	A3	Address bus	97	O/ I/O	RASU-/PTD[1]	Upper 32 Mbytes address RAS(SDRAM)/input output port D
49	—	VssQ	Input/output power supply (0 V)	98	O/ I/O	CASL-/PTD[2]	Lower 32 Mbytes address CAS(SDRAM)/input output port D
50	O	A4	Address bus	99	O/ I/O	CASU-/PTD[3]	Upper 32 Mbytes address CAS(SDRAM)/input output port D
51	—	VccQ	Input/output power supply (3.3 V)	100	O/ I/O	CKE/PTD[4]	CK enable(SDRAM)/input/output port D

HD6417706F133 (IC24) Terminal description (2/2)

PIN	I/O	Name	Function	PIN	I/O	Name	Function
101	I/I/O	IOIS16-/PTD[5]	IOIS16(PCMCIA)/input port D	139	—	VccQ	Input/output power supply (3.3 V)
102	O	BACK-	Bus acknowledge	140	O	TxD0/SCPT[0]	SCI transmit data 0/SC port
103	I	BREQ-	Bus request	141	I/O	SCK0/SCPT[1]	SCI clock 0/SC port
104	i	WAIT-	Hardware wait request	142	O	TxD2/SCPT[2]	SCIF transmit data 2/SC port
105	O/I/O	DACK0/PTE[0]	DMA acknowledge 0/input/output port E	143	I/O	SCK2/SCP[3]	SCIF clock 2/SC port
106	O/I/O	DACK1/PTE[1]	DMA acknowledge 1/input/output port E	144	O/I/O	RTS2-/SCPT[4]	SCIF transmit request 2/SC port
107	O/I/O	DRAK0/PTE[2]	DMA request acknowledge/input/output port E	145	I	RxD0/SCPT[0]	SCI receive data 0/SC port
108	O/I/O	DRAK1/PTE[3]	DMA request acknowledge/input/output port E	146	I	RxD2/SCPT[2]	SCIF receive data 2/SC port
109	I/O	AUDATA[0]/PTF[0]	AUD data/ input/output port F	147	I	CTS2-/IRQ5/SCPT[5]	SCIF transmit clear/external interruption request/SC port
110	I/O	AUDATA[1]/PTF[1]	AUD data/ input/output port F	148	—	Vss	Internal power supply (0 V)
111	I/O	AUDATA[2]/PTF[2]	AUD data/ input/output port F	149	I	RESETM-	Manual reset request
112	I/O	AUDATA[3]/PTF[3]	AUD data/ input/output port F	150	—	Vcc	Internal power supply (1.9 V)
113	O/I/O	AUDSYNC-/PTF[4]	AUD synchronous/ input/output port F	151	I/I/I/O	IRQ0/IRL0-/PTH[0]	External interrupt request/input/output port H
114	I	TDI/PTG[0]	Data input(H-UDI)/input port G	152	I/I/I/O	IRQ1/IRL1-/PTH[1]	External interrupt request/input/output port H
115	—	Vss	Internal power supply (0 V)	153	I/I/I/O	IRQ2/IRL2-/PTH[2]	External interrupt request/input/output port H
116	I	TCK/PTG[1]	Clock(H-UDI)/input port G	154	I/I/I/O	IRQ3/IRL3-/PTH[3]	External interrupt request/input/output port H
117	—	Vcc	Internal power supply (1.9 V)	155	I/I/O	IRQ4/PTH[4]	External interrupt request/input/output port H
118	I	TMS/PTG[2]	Mode select(H-UDI)/input port G	156	—	VssQ	Input/output power supply (0 V)
119	I	TRST-/PTG[3]	Reset(H-UDI)/input port G	157	I	NMI	Nonmaskable interrupt request
120	O/I/O	TDO/PTF[5]	Data output(H-UDI)/input/output port F	158	—	VccQ	Input/output power supply (3.3 V)
121	O/I/O	ASEBRKAK-/PTF[6]	ASE break acknowledge(H-UDI)/input/output port F	159	I	AUDCK/PTG[4]	AUD clock/input port G
122	I	ASEMD0-*3	ASE mode(H-UDI)	160	I/I/O	DREQ0-/PTH[5]	DMA request/input/output port H
123	—	Vcc-PLL1*2	PLL1 power supply (1.9 V)	161	I/I/O	DREQ1-/PTH[6]	DMA request/input/output port H
124	—	CAP1	PLL1 external capacitance pin	162	I	ADTRG-/PTG[5]	Analog trigger/input port G
125	—	Vss-PLL1*2	PLL1 power supply (0 V)	163	I	MD0	Clock mode setting
126	—	Vss-PLL2*2	PLL2 power supply (0 V)	164	I	MD2	Clock mode setting
127	—	CAP2	PLL2 external capacitance pin	165	I	RESETP-	Power-on reset request
128	—	Vcc-PLL2*2	PLL2 power supply (1.9 V)	166	I	CA	Chip activate/hardware standby request
129	I	MD1	Clock mode setting	167	I	MD3	Area 0 bus width setting
130	—	Vss	Internal power supply (0 V)	168	I	MD4	Area 0 bus width setting
131	O	XTAL	Clock oscillator pin	169	I	MD5	Endian setting
132	I	EXTAL	External clock/crystal oscillator pin	170	—	AVss	Analog power supply (0 V)
133	O/I/O	STATUS0/PTE[4]	Processor status/input/output port E	171	I	AN[0]/PTJ[0]	A/D converter input/input port J
134	O/I/O	STATUS1/PTE[5]	Processor status/input/output port E	172	I	AN[1]/PTJ[1]	A/D converter input/input port J
135	I/O	TCLK/PTE[6]	TMU or RTC clock input/output/input/output port E	173	I/O/I	AN2[2]/DA[1]/PTJ[2]	A/D converter input/ D/A converter output/ input port J
136	O/I/O	IRQOUT-/PTE[7]	Interrupt request notification/output/input/output port E	174	I/O/I	AN3[3]/DA[0]/PTJ[3]	A/D converter input/ D/A converter output/ input port J
137	—	VssQ	Input/output power supply (0 V)	175	—	AVcc	Analog power supply (3.3 V)
138	I/O	CKIO	System clock input/output	176	—	AVss	Analog power supply (0 V)

Notes: *1 Must be connected to the power supply even when the RTC is not used.

*2 Must be connected to the power supply even when the on-chip PLL circuits are not used.(EXcept in hardware standby mode.)

*3 Must be high level when the user system is used independently without using the emulator or H-UDI.

1. Except in hardware standby mode, all Vcc/Vss pins must be connected to the system power supply. (Supply power constantly.) In hardware standby mode, power must be supplied at least to Vcc-RTC and Vss-RTC. If power is not supplied to Vcc and Vss pins other than Vcc-RTC and Vss-RTC, hold the CA pin low.
2. A1, A2, A3, A7, A12, B1, C4, C7, D1, D2, D4, D7, D14, D15, E1, E2, E3, E4, F14, F17, G17, H14, H15, K14, P14, R10, T13, T15, T16, U11, U15, and U16 must be connected to Vss.

4) LC272D0BT-WA6 (IC6): pin-216, QFP (MAIN ASIC)

The device is the embed-array, which has the following functions.

① CPU interface

The block has the following functions.
That is, mapping executed in memory areas CS0 and CS4, that are generated by main CPU (SH-3), and then wait control and access control to the peripheral devices.

② NOR type flash memory interface

The block has control the protections to each block of a NOR flash memory. The NOR flash memory is used as two provided blocks; programming memory block and the entry and history data block.

③ NAND type flash memory interface

The block has the following functions. That is, access control to flash memory (standard setting memory and optional setting memory), and generates ECC code at accessing NAND flash memory.

④ DMA request control

The block has the following functions. That is, generate the two internal DMA requests; read request from FIFO buffer for encodes and write request from FIFO buffer for decodes. And set each request to the DMA request channels, ch0 and ch1 by setting register.

⑤ Interrupt request control

The block has the following functions. That is, encode interrupt request signal code by each generated interrupt priority level. And then at the each interrupt, set priority level, mask and clear interrupt factor.

⑥ CIS control and image processing

The block has the following functions. That is control the CIS and A/D converts the scanning image data from analogue to digital, and executes the converted image data processing.

⑦ Print image processing and output printing data

The block has the following functions. That is, converts the image data for printing into 400dpi, and applies smoothing processing. And then, output the printing data, according to /HSYNC signal from PCU.

⑧ CODEC

The block has the following functions. The One, the encoding from the image data (bit map data) in the page memory to the code data (MMR/MH) in the system memory. The other, the decoding from the code data (MMR/MH) in system memory to the image data (bit map data) in the page memory.

⑨ Page memory (SDRAM) interface

SDRAM is used as Page memory. The block has the controller of SDRAM and the arbiter of the accesses to SDRAM.

⑩ Scanner motor control

The block has the following function. That is, controls the PWM current control type stepping motor driver that uses a bipolar drive scheme.

⑪ Panel/LCD control

The block has I/O port for key sense and LCD control.

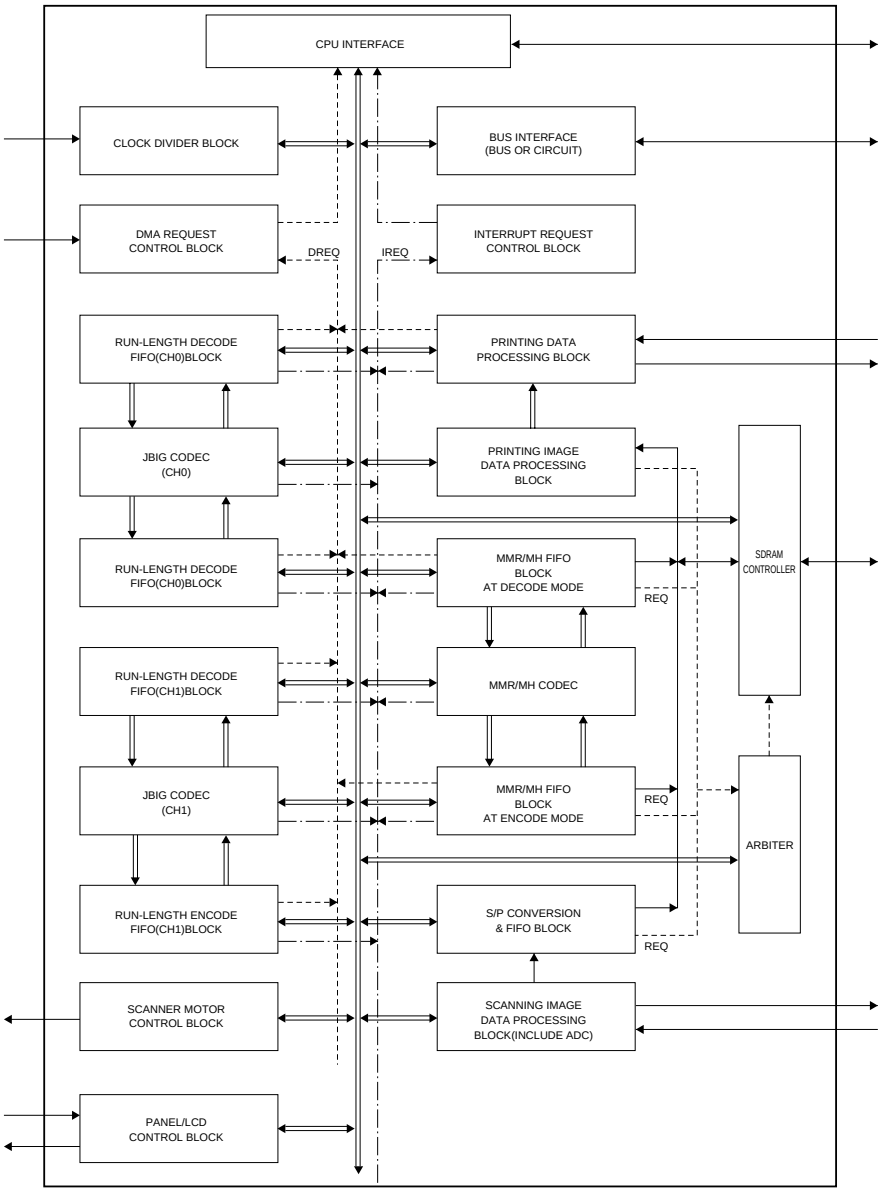


Fig. 3 LC272D0BT-WA6 BLOCK DIAGRAM

LC272D0BT-WA6 (IC6) Terminal description (1/2)

PIN	I/O	Name	Function	PIN	I/O	Name	Function
1	P	VSS	Ground	55	P	VSS	Ground
2	B	D7	Data bus	56	O	XNICACK	Acknowledge signal for NIC
3	B	D6	Data bus	57	I	XNICINT	Interrupt request from NIC board
4	B	D5	Data bus	58	O	XNICCS	Chip select (NIC Board)
5	B	D4	Data bus	59	O	XJBG1	Reserved
6	B	D3	Data bus	60	O	XJBG0	Reserved
7	B	D2	Data bus	61	B	MAD0	Data bus of page memory
8	B	D1	Data bus	62	B	MAD1	Data bus of page memory
9	B	D0	Data bus	63	P	VDD	Power supply
10	I	XCS0	Chip select (Erea 0)	64	P	VSS	Ground
11	I	XCS4	Chip select (Erea 4)	65	B	MAD2	Data bus of page memory
12	O	XDACK0	DMA acknowledge (Ch0)	66	B	MAD3	Data bus of page memory
13	O	XDACK1	DMA acknowledge (Ch1)	67	B	MAD4	Data bus of page memory
14	O	XDRAK0	DMA request acknowledge (Ch0)	68	B	MAD5	Data bus of page memory
15	O	XDRAK1	DMA request acknowledge (Ch1)	69	B	MAD6	Data bus of page memory
16	I	XDREQ0	DMA request (Ch0)	70	B	MAD7	Data bus of page memory
17	I	XDREQ1	DMA request (Ch1)	71	B	MAD8	Data bus of page memory
18	P	VDD	Power supply	72	P	VDD	Power supply
19	P	VSS	Ground	73	P	VSS	Ground
20	O	XFLCS	Chip select (Flash memory)	74	B	MAD9	Data bus of page memory
21	I	XFLSHINTA	Interrupt request of flash memory	75	B	MAD10	Data bus of page memory
22	I	XFLSHINTB	Interrupt request of flash memory	76	B	MAD11	Data bus of page memory
23	O	XINT0	Interrupt request signal	77	B	MAD12	Data bus of page memory
24	O	XINT1	Interrupt request signal	78	B	MAD13	Data bus of page memory
25	O	XINT2	Interrupt request signal	79	B	MAD14	Data bus of page memory
26	O	XINT3	Interrupt request signal	80	B	MAD15	Data bus of page memory
27	O	XPGMCS	Chip select (Program memory)	81	P	VDD	Power supply
28	O	XWROUT	Write strobe signal	82	P	VSS	Ground
29	O	XRDOUT	Read strobe signal	83	O	SDCLK	Clock of page memory
30	O	XWAIT	Wait request signal	84	O	DQMUL	Data mask of page memory
31	I	XBUSYDP	Busy signal of Dual port RAM	85	O	CKE	CK enable of page memory
32	I	XMDMINT1	Interrupt request from modem chip 1	86	O	CASB	CAS of page memory
33	I	XMDMINT0	Interrupt request from modem chip 0	87	O	RASB	RAS of page memory
34	O	XMDMCS1	Chip select (Modem Chip 1)	88	O	DWEB	Write strobe of page memory
35	O	XMDMCS0	Chip select (Modem Chip 0)	89	O	XCSDRM0	Chip select of page memory
36	P	VDD	Power supply	90	P	VDD	Power supply
37	P	VSS	Ground	91	P	VSS	Ground
38	I	XINPRT	Print block clock in	92	O	MA0	Address bus of page memory
39	O	XOUTPRT	Print block clock out	93	O	MA1	Address bus of page memory
40	P	VSS	Ground	94	O	MA2	Address bus of page memory
41	I	TODB	Top of data	95	O	MA3	Address bus of page memory
42	I	HSYNC	Synchronous signal of horizontal anxious	96	O	MA4	Address bu s of page memory
43	O	PDATA	Print data	97	O	MA5	Address bus of page memory
44	I	XJBGINT1	Reserved	98	O	MA6	Address bus of page memory
45	I	XJBGINT0	Reserved	99	P	VDD	Power supply
46	I	XSGAINT	Interrupt request from modem chip 0	100	P	VSS	Ground
47	I	XSBGA	Chip select (Sub Gate array)	101	O	MA7	Address bus of page memory
48	I	JBGDREQ00	Reserved	102	O	MA8	Address bus of page memory
49	I	JBGDREQ01	Reserved	103	O	MA9	Address bus of page memory
50	I	JBGDREQ10	Reserved	104	O	MA10	Address bus of page memory
51	I	JBGDREQ11	Reserved	105	O	MA11	Address bus of page memory
52	O	XJBGACK1	Reserved	106	O	MA12	Address bus of page memory
53	O	XJBGACK0	Reserved	107	O	MA13	Address bus of page memory
54	P	VDD	Power supply	108	P	VDD	Power supply

LC272D0BT-WA6 (IC6) Terminal description (2/2)

PIN	I/O	Name	Function	PIN	I/O	Name	Function
109	P	VSS	Ground	163	P	VSS	Ground
110	I	TEST0	Test pin 0	164	O	TXAI1	Current control 1 (Phase A)
111	I	TEST1	Test pin 1	165	O	TXAI0	Current contorl 0 (Phase A)
112	I	XINSC	Image block Clock in	166	O	CRNT0	Current change signal 0
113	O	XOUTSC	Image block Clock out	167	O	CRNT1	Current change signal 1
114	P	VSS	Ground	168	O	XLBE	Low byte(D7-D0) enable signal
115	O	TOUT	Test pin	169	I	XRESET	System Reset Signal
116	O	LININT	Monitor for line interval signal	170	O	XMANRES	Manual Reset Signal
117	O	SAMP	Monitor for sampling point	171	O	XNANDOPCS	Chip select (Optional memory)
118	O	SH	Line shift clock (CIS)	172	O	XNANDSTDCS	Chip select (Standard memory)
119	O	CLK1	Transfor clock (CIS)	173	O	XNANDRD	Read signal (Nand flash)
120	P	AVDD	Power supply (Analogue)	174	O	XNANDWR	Write signal (Nand flash)
121	P	AVSS	Analogue Ground	175	O	XWP0	Write protect (Standard)
122	I	ADREFL	Low reference voltage (ADC)	176	O	XWP1	Write protect (Optional)
123	I	TEMP	Temperature detect	177	O	ALEO	Address latch enable (Flash memory)
124	I	AVO	Video signal for scanning	178	O	CLEO	Command latch enable (Flash memory)
125	O	ATAPH	High reference voltage (ADC)	179	I	SHCK	CPU Outer bus Clock
126	P	AVDD	Power supply (Analogue)	180	P	VDD	Power supply
127	P	AVSS	Analogue Ground	181	P	VSS	Ground
128	P	VDD	Power supply	182	I	RXW	Read/Write signal
129	P	VSS	Ground	183	I	XBS	Bus cycle start signal
130	O	PLTSW	Plate SW detect	184	I	A25	Address bus bit25
131	O	BKLON	Back light on/off control	185	I	A24	Address bus bit24
132	I	SEN7	Key sense signal	186	I	A23	Address bus bit23
133	I	SEN6	Key sense signal	187	I	A22	Address bus bit22
134	I	SEN5	Key sense signal	188	I	A21	Address bus bit21
135	I	SEN4	Key sense signal	189	I	A20	Address bus bit20
136	I	SEN3	Key sense signal	190	I	A13	Address bus bit13
137	I	SEN2	Key sense signal	191	I	A12	Address bus bit12
138	I	SEN1	Key sense signal	192	I	A11	Address bus bit11
139	I	SEN0	Key sense signal	193	I	A10	Address bus bit10
140	B	LD15	LED	194	I	A9	Address bus bit9
141	B	LD14	LED	195	I	A8	Address bus bit8
142	B	LD13	LCD drive signal	196	I	A7	Address bus bit7
143	B	LD12	LCD drive signal	197	I	A6	Address bus bit6
144	P	VDD	Power supply	198	P	VDD	Power supply
145	P	VSS	Ground	199	P	VSS	Ground
146	B	LD11	Reserved	200	I	A5	Address bus bit5
147	B	LD10	Reserved	201	I	A4	Address bus bit4
148	B	LD9	Reserved	202	I	A3	Address bus bit3
149	B	LD8	Reserved	203	I	A2	Address bus bit2
150	B	LD7	LCD drive	204	I	A1	Address bus bit1
151	B	LD6	LCD drive	205	I	A0	Address bus bit0
152	B	LD5	LED/LCD drive	206	B	XWE0	D7-D0 select signal
153	B	LD4	LED/LCD drive	207	B	XOPDEN	Bus buffer enable control
154	B	LD3	Key matrix select/LED/LCD drive	208	B	D15	Data bus bit15
155	B	LD2	Key matrix select/LED/LCD drive	209	B	D14	Data bus bit14
156	B	LD1	Key matrix select/LED/LCD drive	210	B	D13	Data bus bit13
157	B	LD0	Key matrix select/LED/LCD drive	211	B	D12	Data bus bit12
158	O	TXB	Current direction (Phase B)	212	B	D11	Data bus bit11
159	O	TXBI1	Current control 1 (Phase B)	213	B	D10	Data bus bit10
160	O	TXBI0	Current control 0 (Phase B)	214	B	D9	Data bus bit9
161	O	TXA	Current direction (Phase A)	215	B	D8	Data bus bit8
162	P	VDD	Power supply	216	P	VDD	Power supply

5) LC24199B-WJ0-E (IC21): pin-216, QFP (SUB ASIC)

The device is the gate-array, which has the following functions.

① PCU (Print Control Unit) interface

The block has the serial communication to PCU, and using this circuitry, controls/detects PCU.

② I/O port

The block has the following functions; LIU interface, Speaker control and sensor detect, which are controlled with software.

③ Generator of buzzer's frequency

The block has the generated buzzer's frequency by the software.

④ RTC (Real Time Clock) LSI control

Using serial communication to RTC, the device set and read the time.

⑤ Verification stamp control

The software control on/off of the verification stamp. And the control block has hardware timer instead of the continuous stamp-on status.

⑥ Original sensor detect

The software detects the original sensor. And then the control block has the generated interrupt circuitry by detecting the sensor signal risen/fallen.

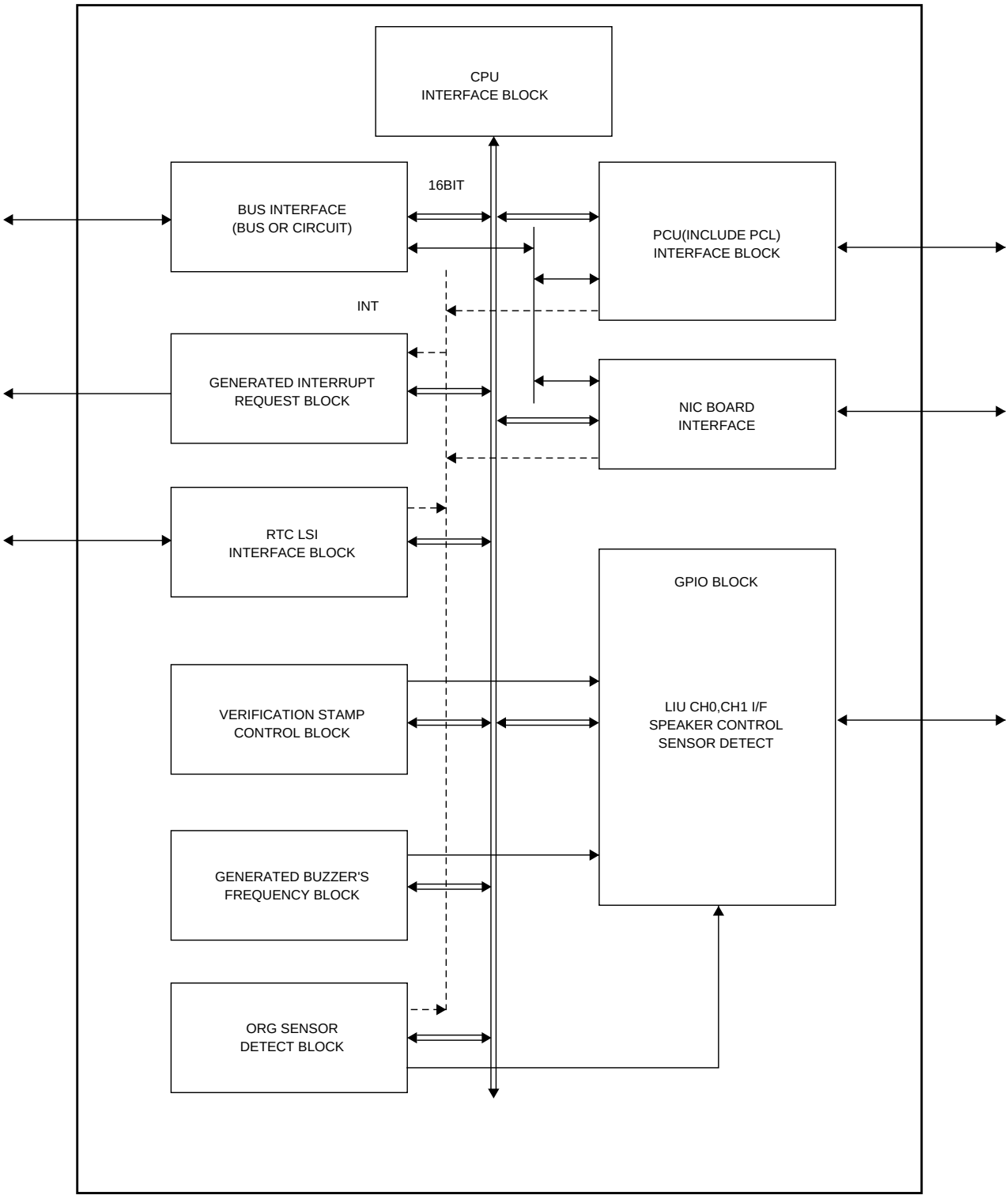


Fig. 4 LC24199B-WJ0-E BLOCK DIAGRAM

LC24199B-WJ0-E (IC21) Terminal description (1/2)

PIN	I/O	Name	Function	PIN	I/O	Name	Function
1	P	VSS	Ground	55	P	VSS	Ground
2	—	N.C	Not connect	56	—	N.C	Not connect
3	I	XCI1	CI detect signal	57	B	DPOPCL10	GPO bus for PCL board
4	O	ERLY0	Reserved for 200V	58	B	DPOPCL11	GPO bus for PCL board
5	O	GAINC0	Reserved for 200V	59	B	DPOPCL12	GPO bus for PCL board
6	O	DPMUTE0	Reserved for 200V	60	B	DPOPCL13	GPO bus for PCL board
7	O	CML0	CML relay control signal	61	B	DPOPCL14	GPO bus for PCL board
8	O	TXMUTE0	Mute control for TX signal	62	B	DPOPCL15	GPO bus for PCL board
9	O	DPON0	Active choke control	63	I	DPAPCL0	Address bus for NIC board (PCL)
10	I	XEXHS0	Hook detect signal for external telephone	64	I	DPAPCL1	Address bus for NIC board (PCL)
11	I	XCI0	CI detect signal	65	I	DPAPCL2	Address bus for NIC board (PCL)
12	I	PDATAM	Print data form main	66	I	DPAPCL3	Address bus for NIC board (PCL)
13	O	CTBSYB	Controller status busy	67	I	DPAPCL4	Address bus for NIC board (PCL)
14	O	CPRDYB	Controller power ready	68	I	DPAPCL5	Address bus for NIC board (PCL)
15	I	ETBSYB	Engine status busy	69	I	DPAPCL6	Address bus for NIC board (PCL)
16	P	VDD	Power supply	70	P	VDD	Power supply
17	P	VSS	Ground	71	P	VSS	Ground
18	I	PRRDYB	Printer ready	72	I	DPAPCL7	Address bus for NIC board (PCL)
19	I	EPRDYB	Engine power ready	73	I	DPAPCL8	Address bus for NIC board (PCL)
20	O	PDATA	Video data of printer	74	I	DPAPCL9	Address bus for NIC board (PCL)
21	O	PCURESB	PCU reset signal	75	I	DPAPCL10	Address bus for NIC board (PCL)
22	O	PCLK	Serial communication clock	76	I	DPAPCL11	Address bus for NIC board (PCL)
23	I	PSTS	Status data from PCU	77	I	DPAPCL12	Address bus for NIC board (PCL)
24	O	PCMD	Command data to PCU	78	I	DPAPCL13	Address bus for NIC board (PCL)
25	I	CTBSYPCLB	Controller status busy in PCL mode	79	I	DPAPCL14	Address bus for NIC board (PCL)
26	I	CPRDYPCLB	Controller power ready in PCL mode	80	I	DPAPCL15	Address bus for NIC board (PCL)
27	O	ETBSYPCLB	Engine status busy in PCL mode	81	I	DPAPCL16	Address bus for NIC board (PCL)
28	O	PRRDYPCLB	Printer ready in PCL mode	82	I	XCSNICP	Chip select signal
29	O	EPRDYPCLB	Engine power ready in PCL mode	83	B	DPONIC0	DPO bus for NIC board
30	I	PDATAINPCL	Video data from PCL	84	B	DPONIC1	DPO bus for NIC board
31	O	PCLRESB	PCL reset signal	85	B	DPONIC2	DPO bus for NIC board
32	O	XNICACKP	Acknowledge signal for NIC in PCL mode	86	B	DPONIC3	DPO bus for NIC board
33	I	RXWP	READ/WRITE signal from PCL	87	B	DPONIC4	DPO bus for NIC board
34	P	VDD	Power supply	88	P	VDD	Power supply
35	P	VSS	Ground	89	P	VSS	Ground
36	I	PCLKPCL	Serial communication clock in PCL mode	90	B	DPONIC5	DPO bus for NIC board
37	O	PSTSPCL	Status data from PCU in PCL mode	91	B	DPONIC6	DPO bus for NIC board
38	I	PCMDPCL	Command data to PCL in PCL mode	92	B	DPONIC7	DPO bus for NIC board
39	O	PACK	Printing acknowledge signal	93	B	DPONIC8	DPO bus for NIC board
40	I	PREQ	Printing request signal	94	B	DPONIC9	DPO bus for NIC board
41	B	DPOPCL0	GPO bus for PCL board	95	B	DPONIC10	DPO bus for NIC board
42	B	DPOPCL1	GPO bus for PCL board	96	B	DPONIC11	DPO bus for NIC board
43	B	DPOPCL2	GPO bus for PCL board	97	B	DPONIC12	DPO Bus for NIC Board(*2)
44	B	DPOPCL3	GPO bus for PCL board	98	B	DPONIC13	DPO Bus for NIC Board(*2)
45	B	DPOPCL4	GPO bus for PCL board	99	B	DPONIC14	DPO Bus for NIC Board(*2)
46	B	DPOPCL5	GPO bus for PCL board	100	B	DPONIC15	DPO Bus for NIC Board(*2)
47	B	DPOPCL6	GPO bus for PCL board	101	O	NICRESB	Reset for NIC
48	B	DPOPCL7	GPO bus for PCL board	102	O	RXWNIC	R/W signal for NIC
49	B	DPOPCL8	GPO bus for PCL board	103	O	XNICACKH	XACK to HOST
50	B	DPOPCL9	GPO bus for PCL board	104	O	XCSNIC	Chip Select Signal for NIC
51	—	N.C	Not connect	105	—	N.C	Not connect
52	P	VDD	Power supply	106	P	VDD	Power supply

LC24199B-WJ0-E (IC21) Terminal description (2/2)

PIN	I/O	Name	Function	PIN	I/O	Name	Function
105	P	VSS	Ground	157	P	VSS	Ground
106	I	SDDCT	SD DICT in	158	I	A3	Address bus
107	I	DPANIC0	Address bus for NIC board	159	I	A2	Address bus
108	I	DPANIC1	Address bus for NIC board	160	I	A1	Address bus
109	O	DPANIC2	Address bus for NIC board	161	I	A0	Address bus
110	P	DPANIC3	Address bus for NIC board	162	I	XWE	Write strobe signal from COSMOS
111	O	DPANIC4	Address bus for NIC board	163	I	RXW	Read/Write Signal
112	O	DPANIC5	Address bus for NIC board	164	I	XRD	Read strobe signal from COSMOS
113	O	DPANIC6	Address bus for NIC board	165	B	D15	Data bus
114	O	DPANIC7	Address bus for NIC board	166	B	D14	Data bus
115	O	DPANIC8	Address bus for NIC board	167	B	D13	Data bus
116	P	DPANIC9	Address bus for NIC board	168	B	D12	Data bus
117	P	DPANIC10	Address bus for NIC board	169	B	D11	Data bus
118	I	DPANIC11	Address bus for NIC board	170	B	D10	Data bus
119	I	DPANIC12	Address bus for NIC board	171	B	D9	Data bus
120	I	VDD	Power supply	172	P	VDD	Power supply
121	O	VSS	Ground	173	P	VSS	Ground
122	—	N.C	Not connect	174	B	D8	Data bus
123	P	DPANIC13	Address bus for NIC board	175	B	D7	Data bus
124	P	DPANIC14	Address bus for NIC board	176	B	D6	Data bus
125	P	DPANIC15	Address bus for NIC board	177	B	D5	Data bus
126	O	DPANIC16	Address bus for NIC board	178	B	D4	Data bus
127	O	XCSNICIN	Chip select of NIC in FAX mode	179	B	D3	Data bus
128	I	GPIO4	PWSAVE: Powr save control for PS-unit	180	B	D2	Data bus
129	I	GPIO5	LEDON: Light ON/OFF for LED in CIS	181	B	D1	Data bus
130	I	GPIO6	VPPCN: VPP control of nor flash memory	182	B	D0	Data bus
131	I	GPIO7	XWP: Write protect for nor flash memory	183	—	N.C	Not connect
132	I	XNICACK	Acknowlede signal for NIC	184	O	INTR	Interrupt request signal
133	I	XROLSNS	Roller position sensor	185	I	XRESET	Reset signal
134	I	XORGSNS	Document sensor	186	I	TEST	Test pin
135	I	XFRSNS	Front sensor	187	O	RTCCE	Chip select (RTC)
136	B	XB4FRS	B4 width sensor	188	O	RTCCK	Serial communication clock (RTC)
137	B	PLNGON	Plunger contorl signal	189	B	RTCDT	Serial communication data (RTC)
138	B	VDD	Power supply	190	P	VDD	Power supply
139	B	VSS	Ground	191	P	VSS	Ground
140	P	SHCLK	External bus Clock(33.3MHz)	192	O	XMDMRST1	Reset signal for modem chip 1
141	P	XCS	Chip select signal	193	O	XMDMRST0	Reset signal for modem chip 0
142	B	A16	Address bus	194	O	BZCONT	Change control of sound source
143	B	A15	Address bus	195	O	SPMUTE	Speaker mute control signal
144	B	A14	Address bus	196	O	VOLC	Speaker volume control signal
145	B	A13	Address bus	197	O	VOLB	Speaker volume control signal
146	B	A12	Address bus	198	O	VOLA	Speaker volume control signal
147	B	A11	Address bus	199	O	BZOUT	Buzzer signal
148	B	A10	Address bus	200	O	GAINC1	Reserved for 200V
149	B	A9	Address bus	201	O	ERLY1	Reserved for 200V
150	B	A8	Address bus	202	O	DPMUTE1	Reserved for 200V
151	B	A7	Address bus	203	O	CML1	CML relay control signal
152	B	A6	Address bus	204	O	TXMUTE1	Mute control for TX signal
153	B	A5	Address bus	205	O	DPON1	Active choke control
154	O	A4	Address bus	206	O	MONSEL	Monitor select/DC character measured
155	—	N.C	Not connect	207	—	N.C	Not connect
156	P	VDD	Power supply	208	P	VDD	Power supply

6) SM8578BV (IC22): pin-8, SOP (Real time clock IC)

It is oscillated with the quartz oscillator of 32.768 kHz, and the clock and calendar functions are provided.
Even if the power supply of the main body is turned off, it is backed up with lithium battery (BAT1).
This device executes the clock-synchronous type serial communication with the Sub ASIC, and CPU can know the time and date through the Sub ASIC.

(2) Backup memory block

This block consists of flash memory for the image memory and 256 Kbit SRAM backed up with a battery.
The image memory has a standard capacity of 2 Mbytes, and it is possible to extend the memory to 10 Mbytes in total by installing the option memory FO-8MK to the connector CNOP1.

1) TC58V64BFT (IC27) ... pin-44, TSOP (64 Mbit NAND EEPROM)

This is non-volatile memory whose contents are not deleted even when the power is turned off. 2 Mbytes are available as an area for storing the encoded data of the copies or transmitted/received images.
It is controlled via the above-mentioned MAIN ASIC (IC6).

2) BS62LV256SC-70 (IC19) ... pin-28, SOP (256 Kbit SRAM)

Operation information before shutting off the power supply, user setting content and soft switch content are stored. Even if the power supply of the main body is turned off, it is backed up with a lithium battery (BAT1).

(3) Modem block

The block is mainly composed of the G3 FAX modem FM336PLus (IC30), and is provided with the following modem function.

1) G3 FAX modem

The modem satisfies the requirements specified in ITU-T recommendations V.34 half-duplex, V.17, V.33, V.29, V.27 ter, V.21, and meets the binary signaling requirements of V.8 and T.30 with Annex F.
Internal HDLC support eliminates the need for an external serial input/output (SIO) device in the DTE for products incorporating error detection and T.30 protocol. The modem can perform HDLC framing per T.30 at all data speeds. CRC generation/checking along with zero insertion/deletion enhances SDLC/HDLC frame operations. Two FSK (V.21 Ch. 1 and V.21 Ch. 2) flag pattern detectors facilitate FSK detection during high-speed reception. The modem features a programmable DTMF transmitter/receiver and three programmable tone detectors.

2) Features

· 2-wire half-duplex fax modem modes with send and receive data rates up to 33.6 kbps.
  — V.34 half-duplex, V.17, V.33, V.29, V.27 ter, and V.21 Channel 2
  — Short train option in V.17 and V.27 ter
· 2-wire duplex data modem modes
  — V.21, V.23 (75 bps TX/1200 bps RX or 1200 bps TX/75 bps RX)
· PSTN session starting
  — V.8 and V.8 bis signaling
· HDLC support at all speeds
  — Flag generation, 0-bit stuffing, ITU-T CRC-16 or CRC-32 calculation and generation
  — Flag detection, 0-bit stuffing, ITU-T CRC-16 or CRC-32 check sum error detection
  — FSK flag pattern detection during high-speed receiving
· Tone modes and features
  — Programmable single or dual tone generation
  — DTMF receiver
  — Tone detection with three programmable tone detectors
· Serial and parallel synchronous data
· Automatic Rate Adaptation (ARA) in V.34 half-duplex
· Auto-dial and auto-answer control
· TTL and CMOS compatible DTE interface
  — ITU-T V.24 (EIA/TIA-232-E) (data/control)
  — Microprocessor bus (data/configuration/control)
· Receive dynamic range:
  — 0 dBm to -43 dBm for V.17, V.33, V.29, V.27 ter and V.21
  — -9 dBm to -43 dBm for V.34 half-duplex
· Caller ID Demodulation
· Single tone detection in Data Mode
· ADPCM Voice Mode (Conexant Proprietary)
· Programmable RSLD turn-on and turn-off thresholds
· Programmable transmit level: 0 to -15 dBm
· Adjustable speaker output to monitor received signal
· DMA support for interrupt lines
· Two 16-byte FIFO data buffers for burst data transfer with extension up to 255 bytes
· Diagnostic capability
· V.21 Channel 1 Flag detect and V.21 Channel 2 Flag detect
· +3.3 V operation with +5 V tolerant inputs
· +5 V analog signal interface
· 100-pin PQFP package
· Typical power consumption
  — Normal mode:
    VDD1 = 250 mW (+3.3 V for DSP); VDD = 35 mW (+5 V for IA)
  — Sleep mode:
    VDD1 = 20 mW (+3.3 V for DSP); VDD = 0.1 mW (+5 V for IA)

3) Configurations, Signaling Rates, and Data Rates

Configuration	Modulation	Carrier Frequency (Hz) ± 0.01 %	Data Rate (bps) ± 0.01 %	Symbol Rate (Symbols/Sec.)	Bits/Symbol-Data	Bits/Symbol-TCM	Constellation Points
V.90 PCM	PCM	—	56000 R/V.34 rates T (Note 4)	8000	Dynamic	—	—
V. 34 33600 TCM[3]	TCM	Note 2	33600	3429 only	Note 2	Note 2	Note 2
V. 34 31200 TCM[3]	TCM	Note 2	31200	3200 min	Note 2	Note 2	Note 2
V. 34 28800 TCM[3]	TCM	Note 2	28800	3000 min	Note 2	Note 2	Note 2
V. 34 26400 TCM[3]	TCM	Note 2	26400	2800 min	Note 2	Note 2	Note 2
V. 34 24000 TCM[3]	TCM	Note 2	24000	2800 min	Note 2	Note 2	Note 2
V. 34 21600 TCM[3]	TCM	Note 2	21600	2400 min	Note 2	Note 2	Note 2
V. 34 19200 TCM[3]	TCM	Note 2	19200	Note 2	Note 2	Note 2	Note 2
V. 34 16800 TCM[3]	TCM	Note 2	16800	Note 2	Note 2	Note 2	Note 2
V. 34 14400 TCM[3]	TCM	Note 2	14400	Note 2	Note 2	Note 2	Note 2
V. 34 12000 TCM[3]	TCM	Note 2	12000	Note 2	Note 2	Note 2	Note 2
V. 34 9600 TCM[3]	TCM	Note 2	9600	Note 2	Note 2	Note 2	Note 2
V. 34 7200 TCM[3]	TCM	Note 2	7200	Note 2	Note 2	Note 2	Note 2
V. 34 4800 TCM[3]	TCM	Note 2	4800	Note 2	Note 2	Note 2	Note 2
V. 34 2400 TCM[3]	TCM	Note 2	2400	2400 only	Note 2	Note 2	Note 2
V. 32 bis 14400 TCM	TCM	1800	14400	2400	6	1	128
V. 32 bis 12000 TCM	TCM	1800	12000	2400	5	1	64
V. 32 bis 9600 TCM	TCM	1800	9600	2400	4	1	32
V. 32 bis 7200 TCM	TCM	1800	7200	2400	3	1	16
V. 32 bis 4800	QAM	1800	4800	2400	2	0	4
V. 32 9600 TCM	TCM	1800	9600	2400	4	1	32
V. 32 9600	QAM	1800	9600	2400	4	0	16
V. 32 4800	QAM	1800	4800	2400	2	0	4
V. 22 bis 2400	QAM	1200/2400	2400	600	4	0	16
V. 22 bis 1200	DPSK	1200/2400	1200	600	2	0	4
V. 22 1200	DPSK	1200/2400	1200	600	2	0	4
V. 22 600	DPSK	1200/2400	600	600	1	0	4
V. 23 1200/75	FSK	1700/420	1200/75	1200	1	0	—
V. 21	FSK	1080/1750	Up to 300	300	1	0	—
Bell 208 4800	DPSK	1800	4800	1600	3	0	8
Bell 212A	DPSK	1200/2400	1200	600	2	0	4
Bell 103	FSK	1170/2125	Up to 300	300	1	0	—
V. 17 14400 TCM/V.33	TCM	1800	14400	2400	6	1	128
V. 17 12000 TCM/V.33	TCM	1800	12000	2400	5	1	64
V. 17 9600 TCM	TCM	1800	9600	2400	4	1	32
V. 17 7200 TCM	TCM	1800	7200	2400	3	1	16
V. 29 9600	QAM	1700	9600	2400	4	0	16
V. 29 7200	QAM	1700	7200	2400	3	0	8
V. 29 4800	QAM	1700	4800	2400	2	0	4
V. 27 4800	DPSK	1800	4800	1600	3	0	8
V. 27 2400	DPSK	1800	2400	1200	2	0	4
V. 21 Channel 2	FSK	1750	300	300	1	0	—

Notes:

1. Modulation legend: TCM: Trellis-Coded Modulation QAM: Quadrature Amplitude Modulation PCM: Pulse Coded Modulation
   FSK: Frequency Shift Keying DPSK: Differential Phase Shift Keying
2. Adaptive; established during handshake:

Symbol Rate (Baud)	V. 34 Low Carrier Frequency (Hz)	V. 34 High Carrier Frequency (Hz)
2400	1600	1800
2800	1680	1867
3000	1800	2000
3200	1829	1920
3429	1959	1959

3. For both duplex and half-duplex modes.
4. Maximum data rate.

FM336Plus (IC30) Terminal description

PIN	I/O	Name	Interface	PIN	I/O	Name	Interface
1	—	RESERVED	NC	51	—	RESERVED	NC
2	IA	RS2	HOST Interface	52	GND	VSUB	—
3	IA	RS3	HOST Interface	53	GND	VSS	—
4	IA	RS4	HOST Interface	54	—	NC	NC
5	IA	/CS	OHOST Interface	55	—	NC	NC
6	IA	/WR	HOST Interface	56	MI	SLEEP	Modem Interconnect
7	IA	/RD	HOST Interface	57	PWR	VDD1	—
8	OA	/RDCLK	DTE Serial Interface	58	—	NC	NC
9	OA	/RLSD	DTE Serial Interface	59	—	RESERVED	NC
10	OA	TDCLK	DTE Serial Interface	60	—	RESERVED	NC
11	IA	TXD	DTE Serial Interface	61	MI	SR1IO	Modem Interconnect
12	OA	/CTS	DTE Serial Interface	62	PWR	VCORE	—
13	PWR	VDD1	—	63	PWR	VDD1	—
14	—	RESERVED	NC	64	IA	XTCLK	DTE Serial Interface
15	—	RESERVED	NC	65	GND	VSS	—
16	GND	VSS	—	66	—	RESERVED	NC
17	—	NC	NC	67	OA	RXD	DTE Serial Interface
18	IA	/RESET	Modem Interconnect	68	IA	/DTR	DTE Serial Interface
19	OA	SR4OUT	Modem Interconnect	69	PWR	VDD1	—
20	—	NC	NC	70	MI	IA SLEEP	Modem Interconnect
21	IA	SR4IN	Modem Interconnect	71	PWR	VGG	—
22	OA	CLK OUT	Modem Interconnect	72	OA	YCLK	Overhead Signal
23	OA	EYESYNC	Diagnostic Signal	73	OA	XCLK	Overhead Signal
24	OA	EYECLK	Diagnostic Signal	74	OA	EYEXY	Diagnostic Siganl
25	GND	MAVSS	—	75	OA	/DSR	DTE Serial Interface
26	PWR	MAVDD	—	76	OA	/RI	Telephone Line Interface
27	O(DF)	SPKR	Telephone Line Interface	77	IA	RINGD	Telephone Line Interface
28	O(DD)	TXA2	Telephone Line Interface	78	IA	/RTS	DTE Serial Interface
29	O(DD)	TXA1	Telephone Line Interface	79	OA	IRQ	HOST Interface
30	MI	VREF	Modem Interconnect	80	GND	VSS	—
31	MI	VC	Modem Interconnect	81	MI	GP00	Modem Interconnect
32	I(DA)	RIN	Telephone Line Interface	82	—	RESERVED	NC
33	AGND	MAVSS	—	83	—	RESERVED	NC
34	IA	/POR	Modem Interconnect	84	PWR	VDD1	—
35	—	RESERVED	NC	85	I	XTALI/CLKIN	Overhead Signal
36	—	RESERVED	NC	86	O	XTALO	Overhead Signal
37	O(DD)	/TALK	Telephone Line Interface	87	IA/OB	D0	HOST Interface
38	PWR	VDD	—	88	IA/OB	D1	HOST Interface
39	—	RESERVED	NC	89	IA/OB	D2	HOST Interface
40	—	RESERVED	NC	90	IA/OB	D3	HOST Interface
41	—	NC	NC	91	IA/OB	D4	HOST Interface
42	IA	M CNTRL SIN	Modem Interconnect	92	PWR	VDD1	—
43	IA	M CLKIN	Modem Interconnect	93	IA/OB	D5	HOST Interface
44	IA	M TXSIN	Modem Interconnect	94	IA/OB	D6	HOST Interface
45	IA	M SCK	Modem Interconnect	95	IA/OB	D7	HOST Interface
46	IA	M RXOUT	Modem Interconnect	96	IA/OB	RS0	HOST Interface
47	IA	M STROBE	Modem Interconnect	97	IA/OB	RS1	HOST Interface
48	—	RESERVED	NC	98	PWR	PLL VDD	—
49	O(DD)	OH	Telephone Line Interface	99	GND	VSS	—
50	PWR	VDD	—	100	GND	PLL GND	—

Notes:
1. I/O types: MI: Modem interconnect IA, IB: Digital input O(DD), O(DF): Analog input
I(DA): Analog input OA, OB: Digital output
2. NC= No external connection required. RESERVED= No external connection allowed.
3. Interface Legend:
HOST= Modem Control Unit (Host)
DET= Data Terminal Equipment

(4) Scanner control block

1) Image signal process block

The CIS is driven by MAIN ASIC (IC6), and the output video signal from the CIS is input into IC6 through the amplifying circuit.
The ADC and buffer are provided in IC6, and the digital image processing is performed.

2) Mechanical control block

The mechanical control block is mainly composed of MAIN ASIC to control the following.

(a) Scanner motor control

The revolution speed and timing of the scanner motor are controlled to output the control signals to the motor driver (IC3).

(b) Verification stamp and LED lamp control

On/off of the end verification and LED lamp of CIS is controlled with the software.

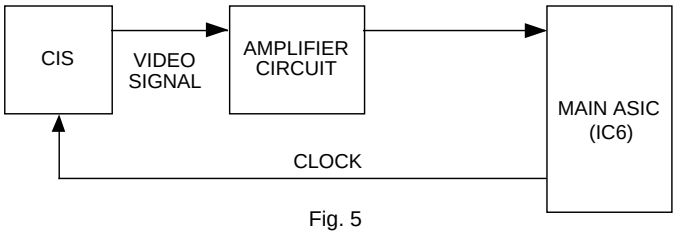


Fig. 5

(5) Speaker amplifier

The speaker amplifier monitors the line under the on-hook mode, outputs the buzzer sound generated by SUB ASIC, ringer sound, DTMF generated from the modem, and line sound.

(6) Page memory block

W986416DH or MT48LC4M16A2TG (IC5): pin-54, TSOP (64 Mbit SDRAM)

The page memory block is composed of one SDRAM of 64 Mbits, being commonly used as the image memory. The memory is divided into the page memory for the scanner and the page memory for printing.
This memory is controlled by the MAIN ASIC directly.

The page memory for scanner is composed of the partial area of IC5. The image data of approx. one page (except in the super fine mode) of the draft read with the scanner can be stored. They are stored until they are contracted by CODEC function in MAIN ASIC.

The page memory for printing is composed of the remaining areas of IC5 and can store approx. one page of the image data decoded by CODEC function in MAIN ASIC. The data are stored until they are transferred to Printer PWB with the SUB ASIC and printed.

(7) Driver block

Sending motor driver (IC3: LB1845) ---- 28-pin DIP

This IC driver at the sending motor at the constant current with the bipolar, chopper system.

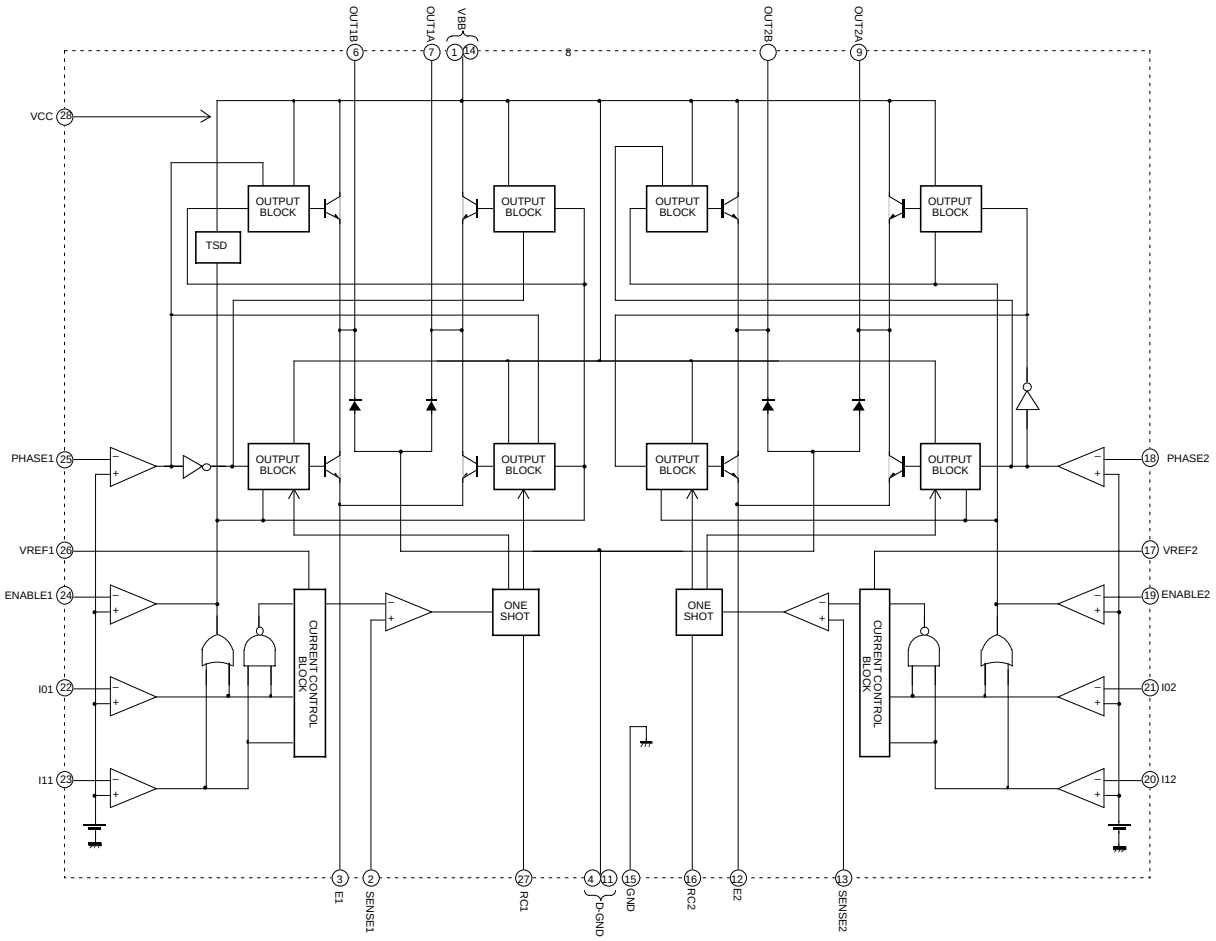


Fig. 6

I_0	I_1	Output Current
L	L	Vref/ (10 x R_E) = I_{OUT}
H	L	Vref/ (15 x R_E) = I_{OUT} x 2/3
L	H	Vref/ (30 x R_E) = I_{OUT} x 1/3
H	H	0

Note: When ENABLE = H or I_0 = I_1 = H, the output is in OFF state.

[Truth Table]

ENABLE	PHASE	OUTA	OUTB
L	H	H	L
L	L	L	H
H	–	OFF	OFF

LB1845 (IC3) Terminal description

Pin name	Pin No.	Pin Description
VBB	1, 14	Output stage power-supply voltage
SENSE1 SENSE2	2 13	Set current detection pins. Connect these pins, fed back through noise filters, to E1, and E2.
E1 E2	3 12	Current control pins by connecting between this pin and GND.
DGND	4,11	Internal diode anode connection
OUT1B OUT1A OUT2B OUT2A	6 7 8 9	Output pins
GND	15	Ground
RC1 RC2	27 16	Used to set the output off time for the switched output signals. The fixed off times are set by the capacitors and resistors connected to these pins. t off ≒ CR
Vref1 Vref2	26 17	Output current settings The output current is determined by the voltage (in the range 1.5 to 7.5V) input to these pins.
PHASE1 PHASE2	25 18	Output phase switching inputs. [H] input : OUT A = high, OUT B = low [L] input : OUT A = low, OUT B = high
ENABLE1 ENABLE2	24 19	Output on/off settings [H] input : output OFF [L] input : output ON
I01, I11 I02, I12	22, 23 21, 20	Digital inputs that set the output current The output currents can be set to 1/3, 2/3, or full by setting these pins to appropriate combinations of high and low levels.
VCC	28	Logic block power supply.

[3] Circuit description of CIS unit

1. CIS

CIS is an image sensor which puts the original paper in close contact with the full-size sensor for scanning, being a monochromatic type with the pixel number of 1,728 dots and the main scanning density of 8 dots/mm.

It is composed of sensor, rod lens, LED light source, control circuit and so on, and the reading line and focus are previously adjusted as the unit.
Due to the full-size sensor, the focus distance is so short that the set is changed from the light weight type to the compact type.

2. Waveforms

The following clock is supplied from LC272DOBT-WA6 via 74HCT244 on the control board, and AO is output.

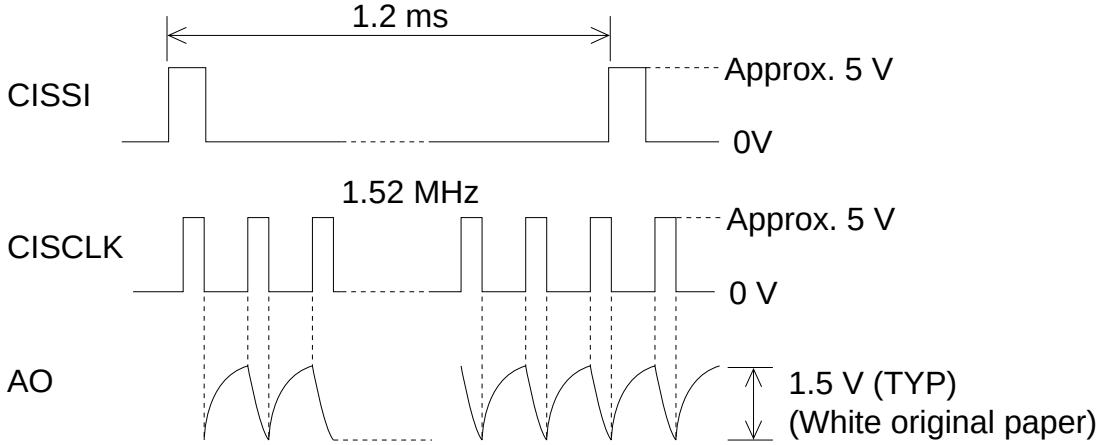


Fig. 7

[4] Circuit description of LIU PWB

(1) LIU block operational description

1) Block diagram

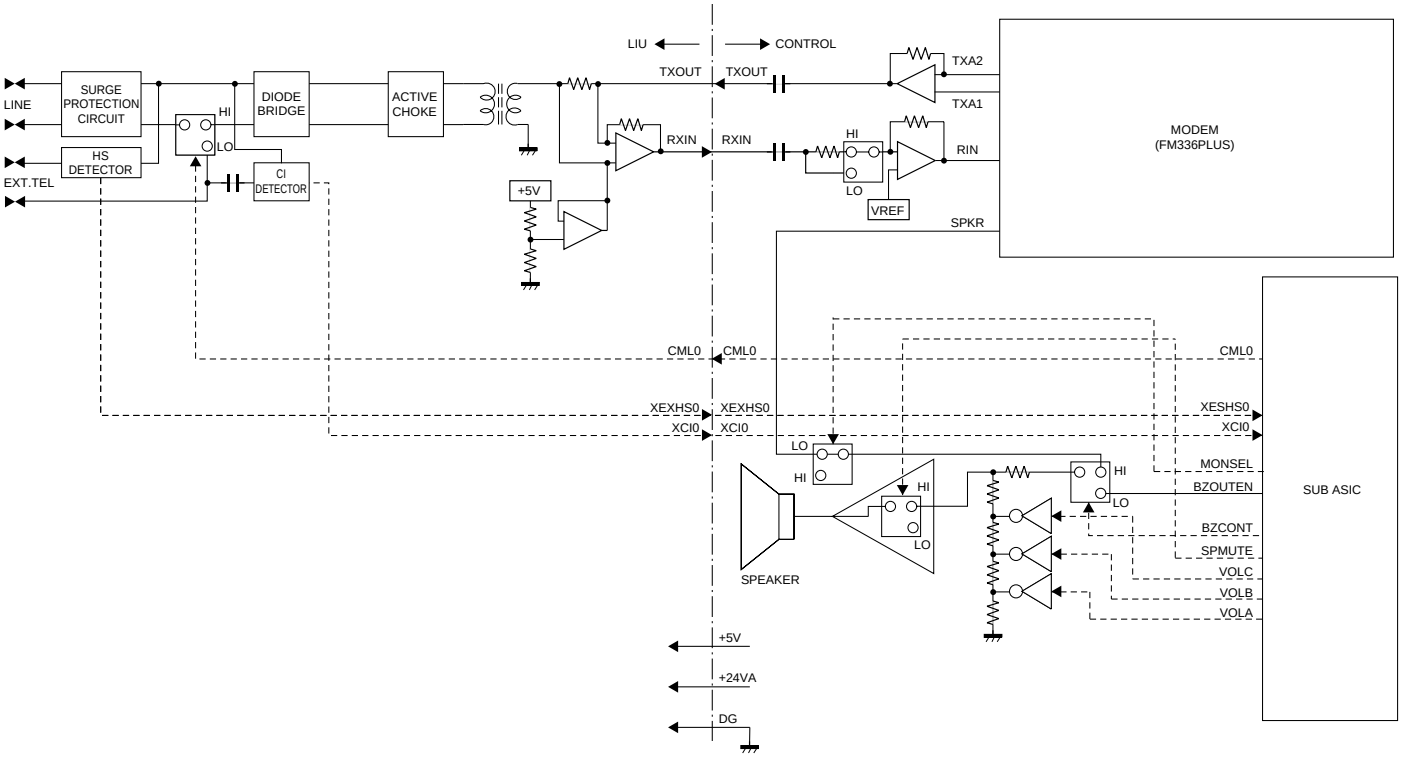


Fig. 8

2) Circuit description

The LIU PWB is composed of the following 9 blocks.

1. Surge protection circuit
2. On-hook status detection circuit
3. Dial puse generation circuit
4. CML relay
5. Matching transformer
6. Hybrid circuit
7. Signal selection
8. CI detection circuit
9. Power supply and bias circuit

3) Block description

1. Surge Protection circuit

This circuit protects the circuit from the surge voltage occurring on the telephone line.

- The AR1 protect the circuit from the 390V or higher line surge voltages.
- The AR2 and AR3 protect the circuit from the 500V or higher vertical surge voltages.
- The ZD6 and ZD7 control the voltage generated on the secondary side of matching transformer to 2V.

2. On-hook status detection circuit

The on-hook status detection circuit detects the Status of the push speaker key, and the status of the hook of a telephone externally connected.

- External telephone hook status detection circuit (XEXHS0)

This circuit comprises the photo-coupler PC3, resistors R13 and R12, Zener diodes ZD1 and ZD2.
When an external telephone is connected and enters the on-hook mode, the LED of photo-coupler PC3 emits light and the light receiving element tuns on. The status signal XEXHS0 is input to the pin10 of (SUB ASIC) (IC21: Control PWB).

XEXHS0 LOW : EXT. TEL OFF-HOOK

XEXHS0 HIGH: EXT. TEL ON-HOOK

3. Dial pulse generation circuit

The pulse dial generation circuit comprises CML.
CML ON: Make

CML OFF: Break

4. CML relay

The CML relay switches over connection to the matching transformer T1 while the FAX is being used.

5. Matching transformer

The matching transformer performs electrical insulation from the telephone line and impedance matching for transmitting the FAX signal.

6. Hybrid circuit

The hybrid circuit performs 2-wire-to-4-wire conversion using the IC of operational amplifier, transmits the voice transmission signal to the line, and feeds back the voice signal to the voice reception circuit as the side tone.

7. Signal selection

The following signals are used to control the transmission line of FAX signal. For details, refer to the signal selector matrix table.

[Control signals from output port]

<table>
<tr><th>Signal Name</th><th>Description</th></tr>
<tr><td>CML0</td><td><u>Line connecting relay and DP generating relay</u>
H: Line make
L: Line brake</td></tr>
<tr><td>SP MUTE</td><td><u>Speaker tone mute control signal</u>
H: Muting (Power down mode)
L: Muting cancel (Normal operation)</td></tr>
<tr><td>VOL A
VOL B
VOL C

(the circuit is located in the control PWB.)</td><td><u>Speaker volume control signal.</u>
VRSEL1 VRSEL2 matrix
<table>
<tr><th></th><th>VOL A</th><th>VOL B</th><th>VOL C</th><th>RING./ Receiving</th><th>Buzzer</th><th>DTMF</th></tr>
<tr><td></td><td>L</td><td>L</td><td>L</td><td>High</td><td>–</td><td>High</td></tr>
<tr><td></td><td>H</td><td>L</td><td>L</td><td>Middle</td><td>High</td><td>Middle</td></tr>
<tr><td></td><td>L</td><td>L</td><td>H</td><td>Low</td><td>Low</td><td>Low</td></tr>
</table></td></tr>
<tr><td>BZCONT

(the circuit is located in the control PWB.)</td><td><u>Speaker output signal switching</u>
L: Buzzer signal output
H: When monitoring line signal</td></tr>
</table>

[SIgnals for status recognition according to input signals]

Signal Name	Function
XCI0	Incoming call (CI) detection signal
XEXHS0	H: The handset or external telephone is in the on-hook state. L: The handset or external telephone in the off-hook state.

[Other signals]

Signal Name	Function
TXOUT	Transmission (DTMF) analog signal output from modem
RXIN	Reception (DTMF, others) analog signal input into modem

NO	Signal Name(CNLIU)	NO	Signal Name(CNLIU)
1	RXIN	6	CML
2	TXOUT	7	+5V
3	CI	8	DG
4	$\overline{\text{EXHS}}$	9	+24VA
5	DPON (N.C.)		

8. CI detection circuit

The CI detection circuit detects the CI signals of 15.3 Hz to 68 Hz. A CI signal, which is provided to the photo-coupler PC1 through the C1 (0.82 uF), R6 (22K), and ZD3 and R5 (13K) when the ring signal is inputted from the telephone line.

9. Power supply and bias circuits

The voltages of +5V and +24VA are supplied from the control PWB unit.

(Example: Fax signal send)

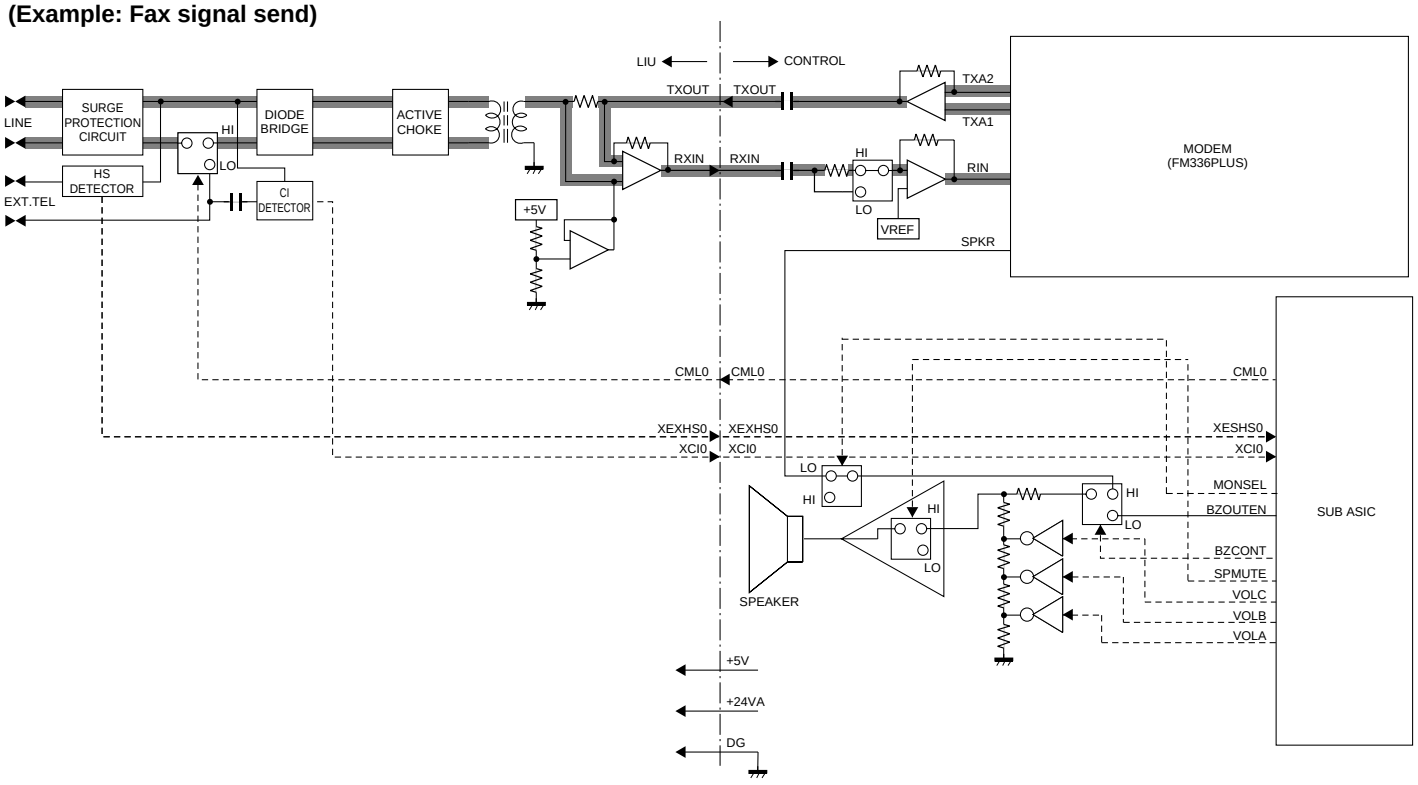


Fig. 9

[5] Circuit description of operation panel PWB

1. Operational description

1) Operation panel PWB

The operation panel PWB includes the ten key scan circuit and the LED lighting circuit.The LS145 is controlled through LD0~LD3 (4 bits) and ten key detection is performed. The HC174 is controlled through LD0~LD5 (6 bits) to provide LED lighting information.

2) COG(LCD) (LMG2025-TPR)

The COG uses the one-chip LCD driver IC to display 20 digits x 2 lines. The LCD display density is controlled with an external resistor.

2. Block diagram

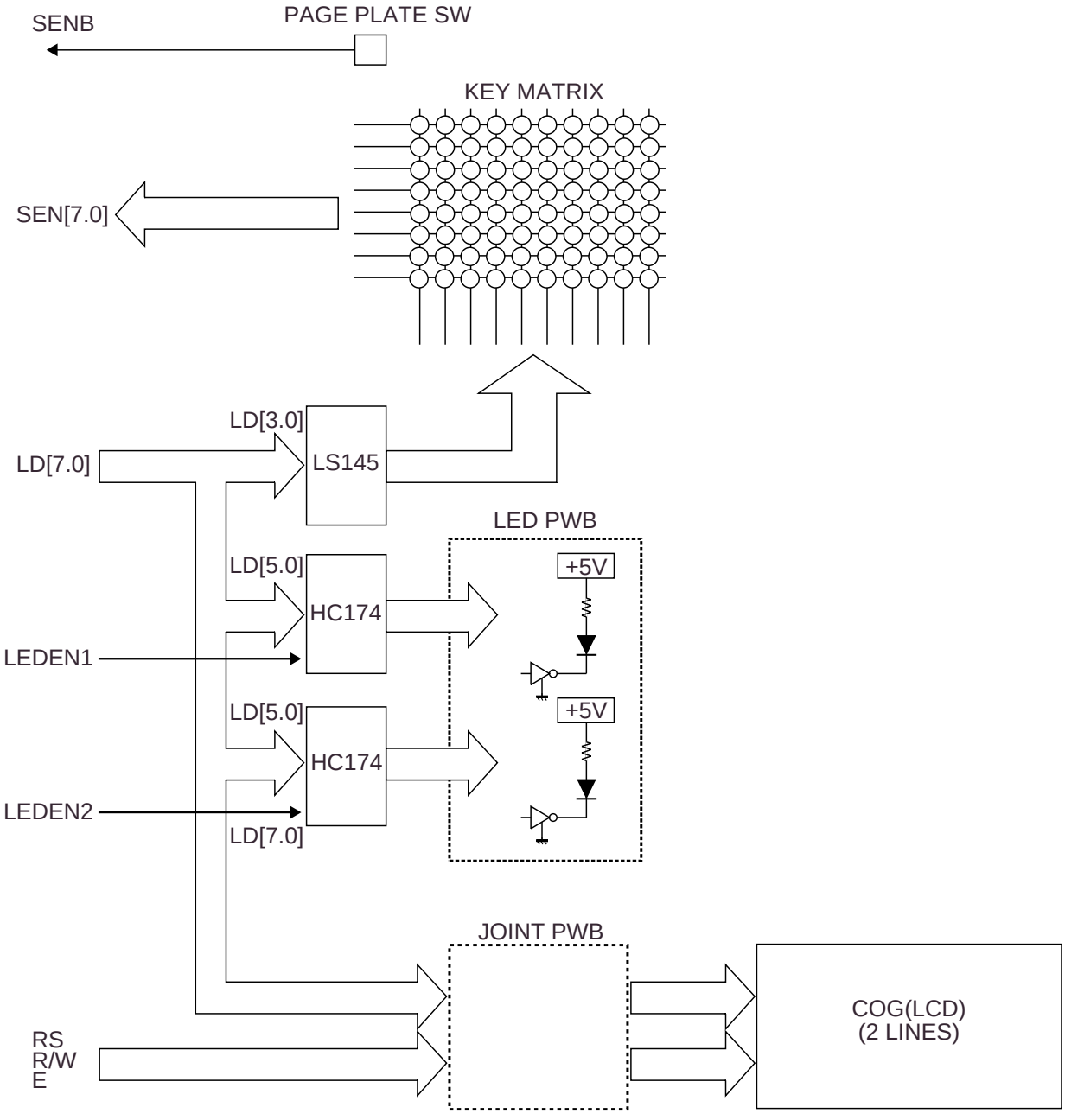


Fig. 10

[6] Circuit description of power supply PWB

This unit supply input AC 120 V/60 Hz, +24 V, +5 V as block diagram shows. (See Fig. 11)

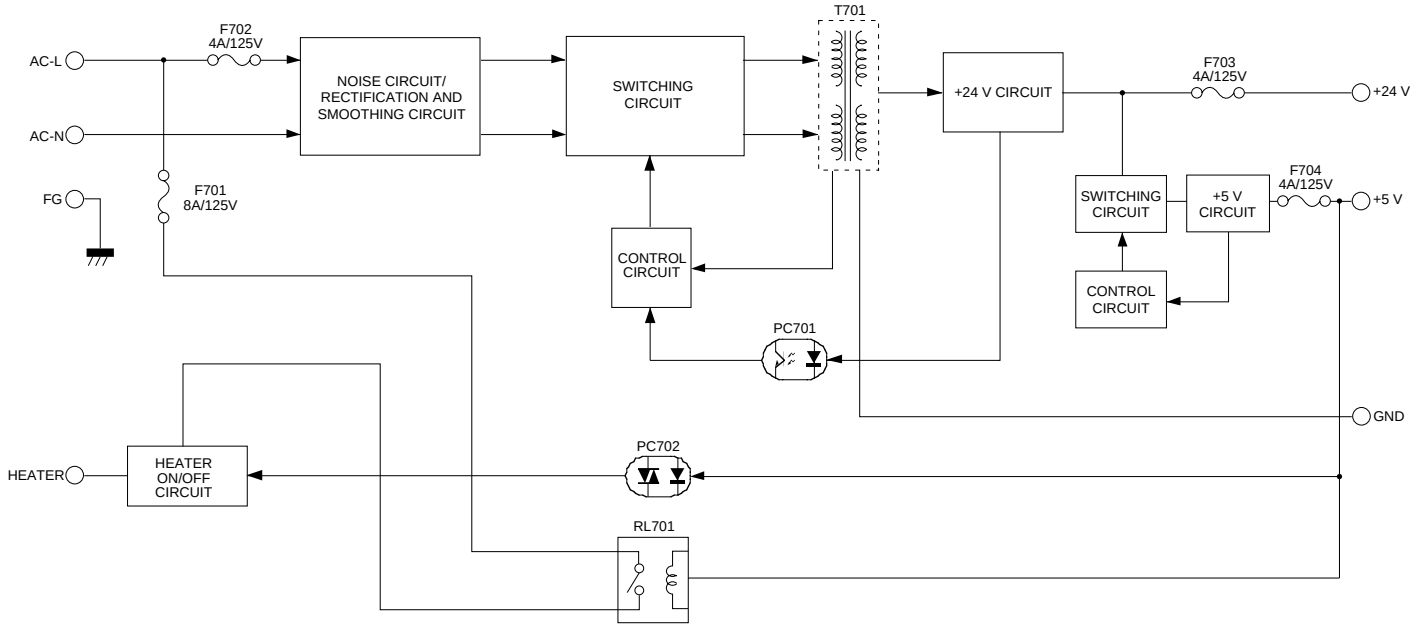


Fig. 11

1. Noise/Rectification and smoothing circuit

Filter part reduces the outgoing noise that generated in the Power Supply unit, and prevents the invasion of the noise from outside. The excessive surge such as the thunder is prevented by Varistor X701.
Rectification and Smoothing circuit is supply DC voltage to switching part by AC input rectify by Diode D701, D702, D703, D704 and smoothing Capacitor C706.

2. Switching circuit

This circuit is adopt Ringing Choke Converter system that self-excited. This system supplies power as follows;
AC voltage that supplied by Rectifying and smoothing part is change high-frequency pulse by NO/OFF repeat of MOS FET Q701. And while Q701 ON, accumulate energy in primary winding of transformer T701. And while OFF, eject energy to secondary winding.
Control of constant voltage is carry out by as follows;
Feedback put on control circuit through photo coupler from +24 V Output. Over Current Protection Circuit detect spread of ON period by Output Load is heavy, and extend OFF period by control circuit. And turn down energy that accumulating in primary winding.
Over Current Protection is make secondary side of output voltage +24 V's rising over voltage condition by conducting Zener Diode D711 that between +24 V output and GND. Then protection is carrying out by Over Current Protection Circuit of Control Circuit working.

3. +24 V circuit

+24 V Circuit is supplied by Transformer T701 Output Rectification and Smoothing by Diode D710, Capacitor C715.

4. +5 V circuit

+5 V Output is carry out stabilization by step-down Chopper Circuit that inputted above +24 V. When MOS FET Q705 ON, this system supply load energy through L705, and when OFF, accumulated energy in L705 Rectification to load by D715. Control of constant voltage is carry out by detect +5 V output by Shunt Regulator and put on Feedback.

5. HEATER ON signal

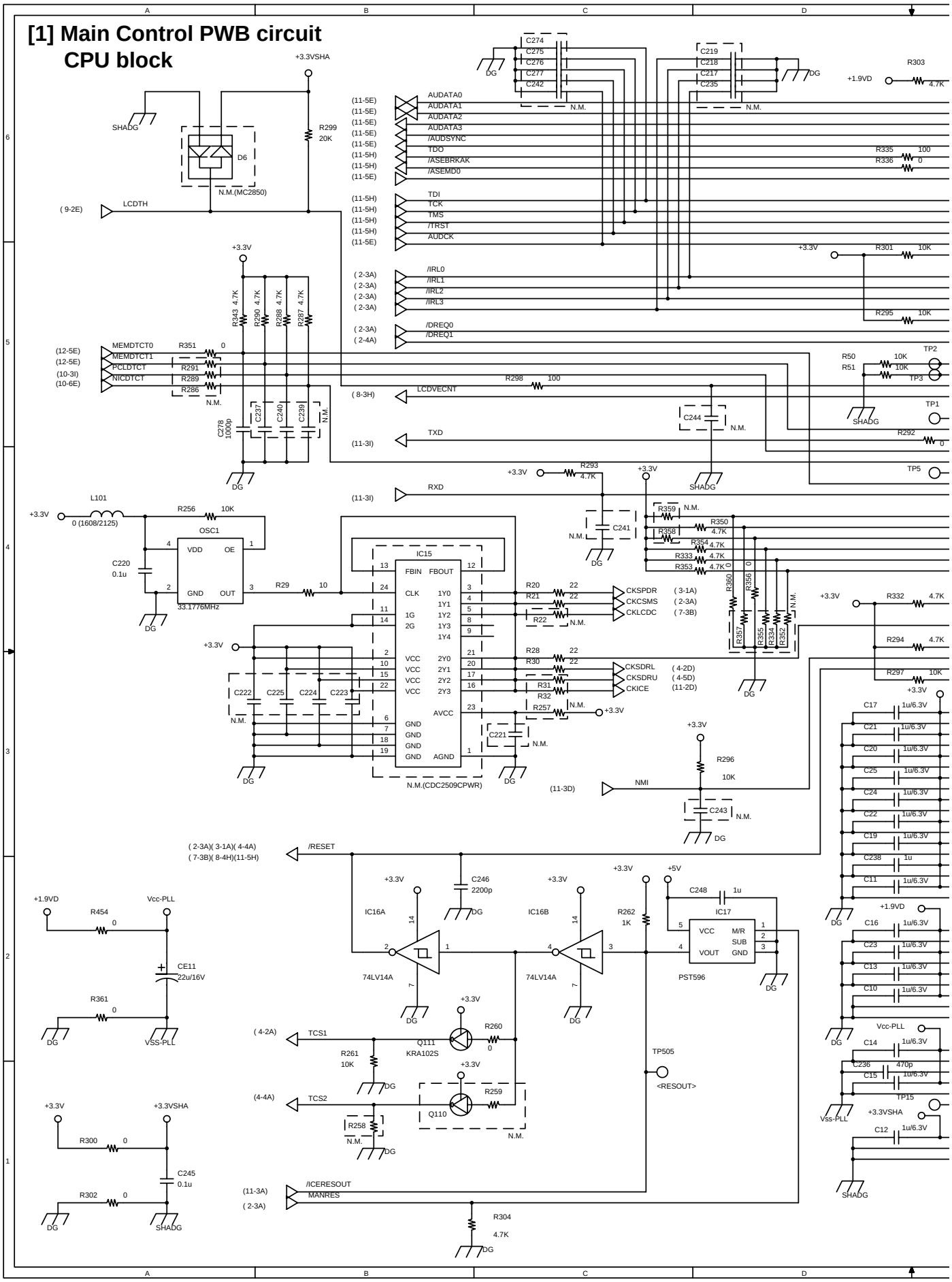
HEATER ON/OFF is carry out by send a signal through Trigger TR701 of Photo Triac Coupler PC702 by (High/Low).

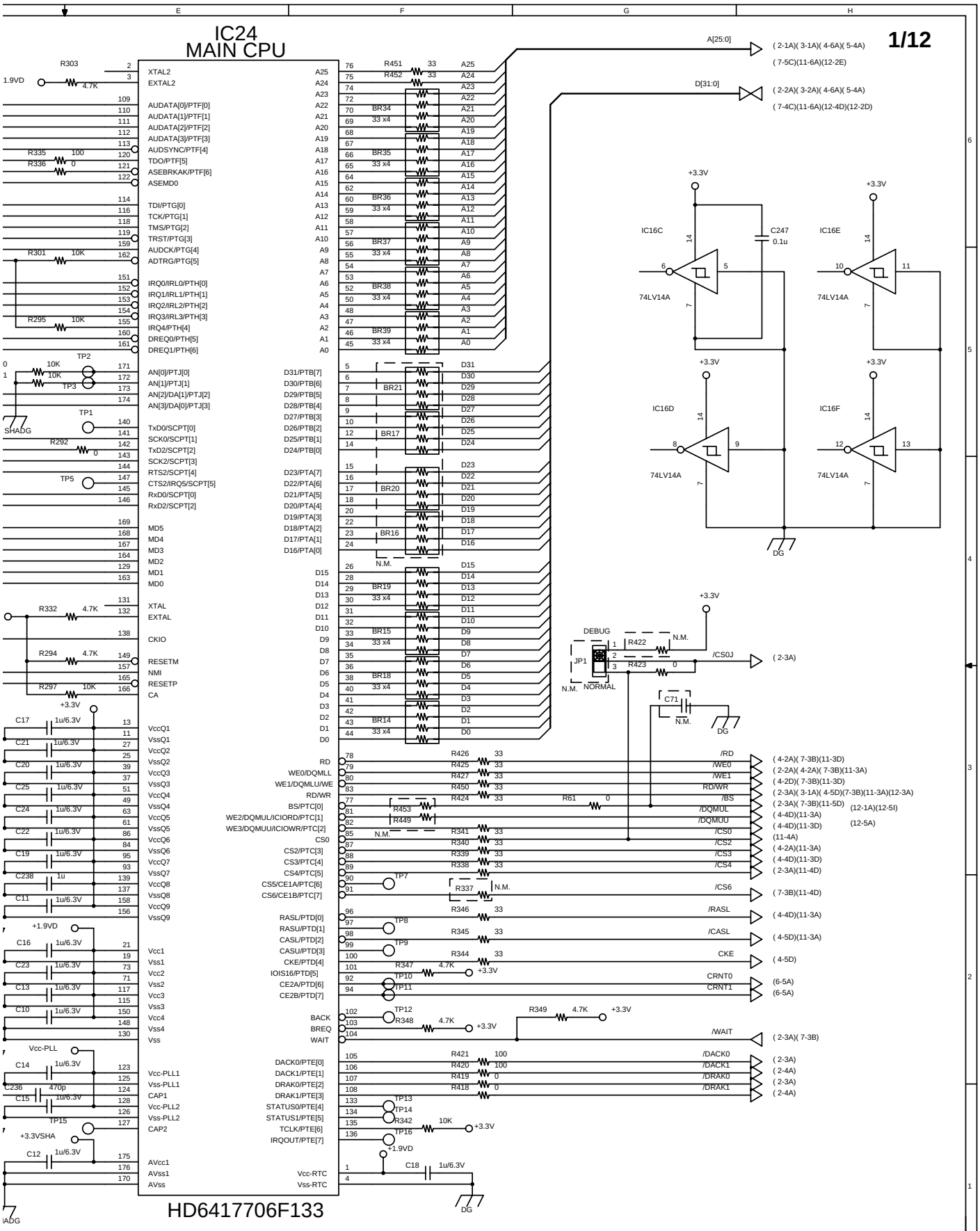
6. HEATER-RELAY OFF signal

ON/OFF of Relay RL701 is carry out by (High/Low). But when HEATER-RELAY OFF Signal change High to Low, Thyristor SR701 keep ON condition. So RL701 keep OFF condition till Power Supply re-inter.

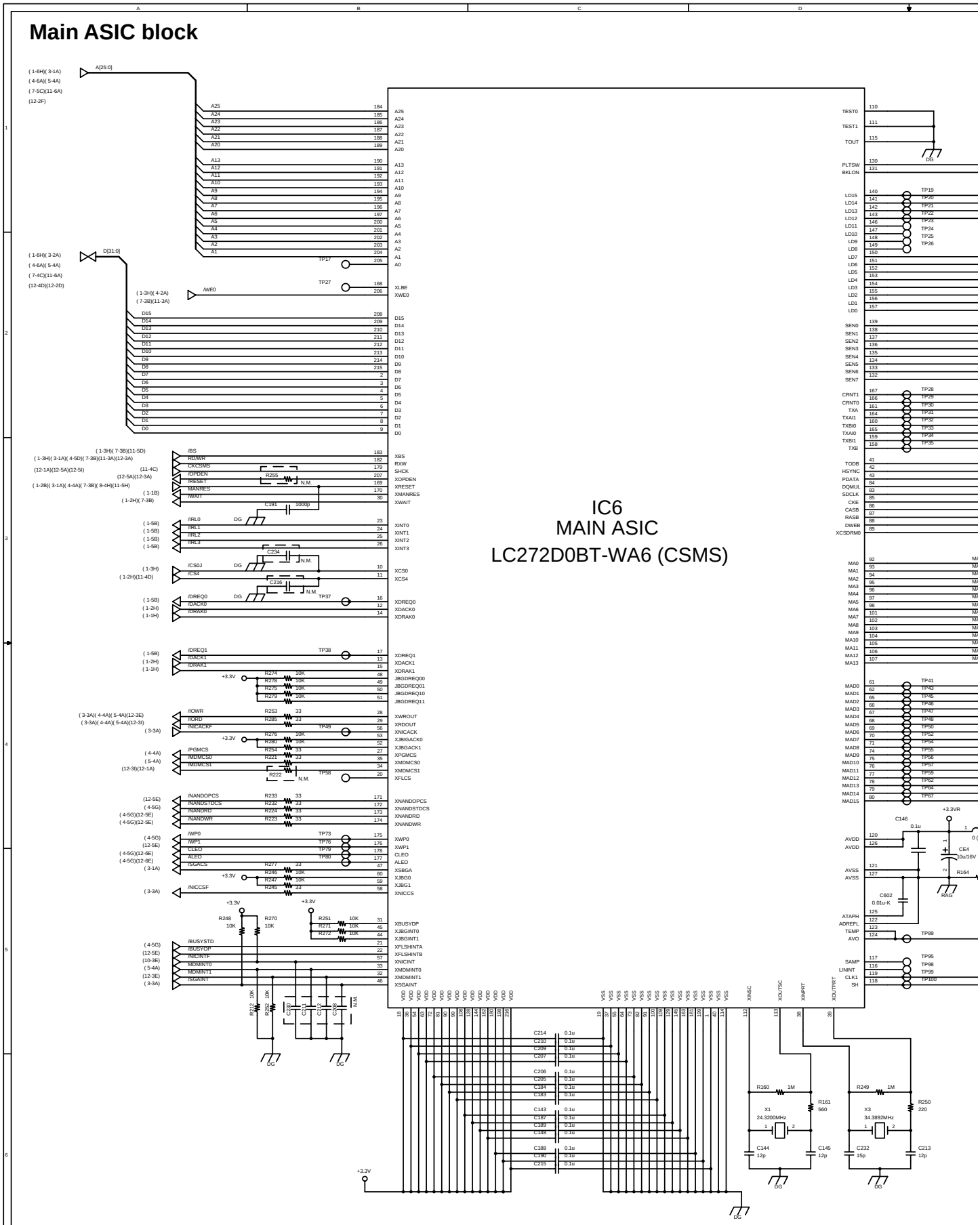
CHAPTER 6. CIRCUIT SCHEMATICS AND PARTS LAYOUT

[1] Main Control PWB circuit
CPU block

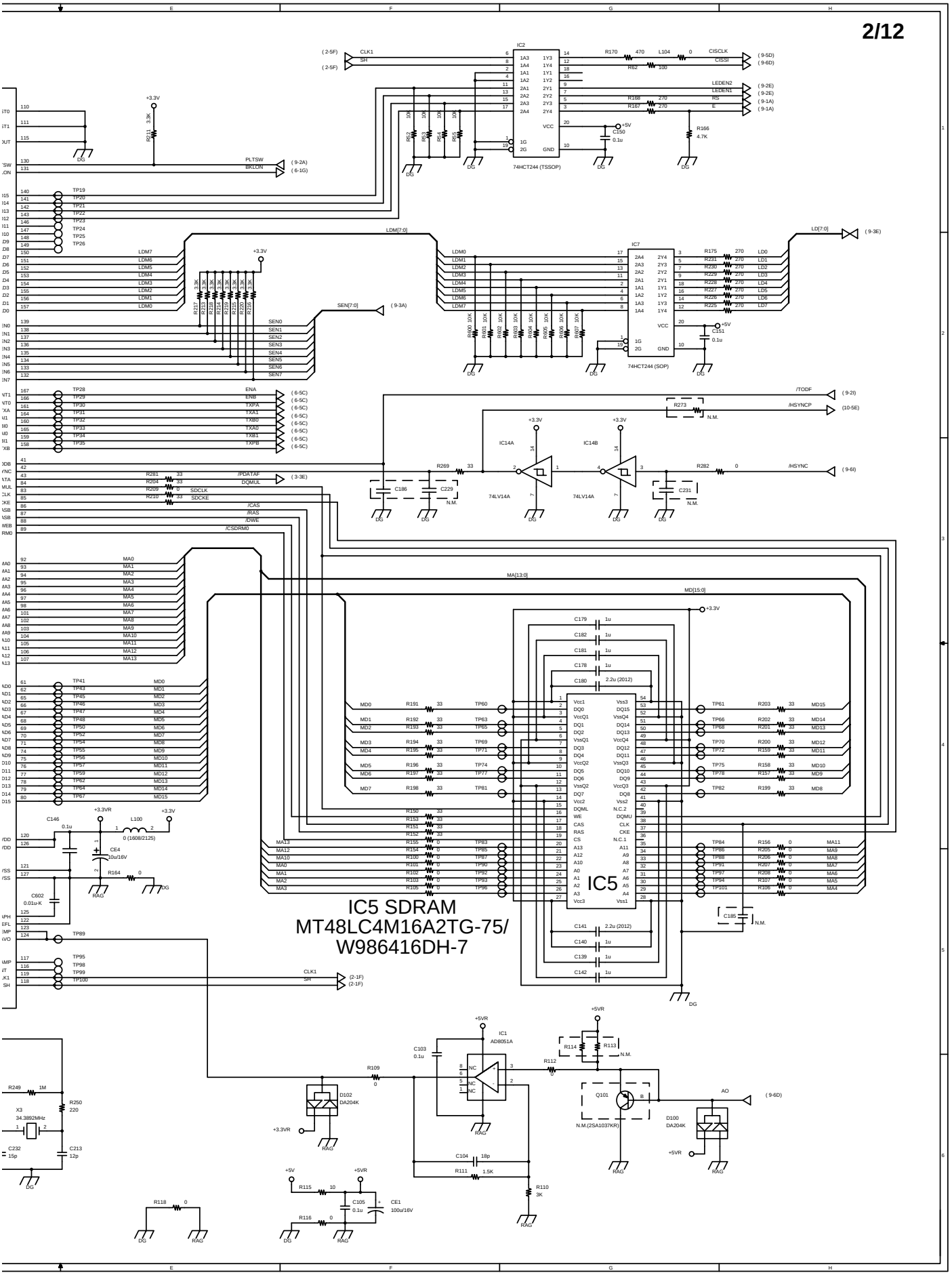



IC24
MAIN CPU
1/12
HD6417706F133
A[25:0]
(2-1A)(3-1A)(4-6A)(5-4A)
(7-5C)(11-6A)(12-2E)
D[31:0]
(2-2A)(3-2A)(4-6A)(5-4A)
(7-4C)(11-6A)(12-4D)(12-2D)
XTAL2
EXTAL2
AUDATA[0]/PTF[0]
AUDATA[1]/PTF[1]
AUDATA[2]/PTF[2]
AUDATA[3]/PTF[3]
AUDSYNC/PTF[4]
TDO/PTF[5]
ASEBRKAK/PTF[6]
ASEMD0
TDI/PTG[0]
TCK/PTG[1]
TMS/PTG[2]
TRST/PTG[3]
AUDCK/PTG[4]
ADTRG/PTG[5]
IRQ0/IRL0/PTH[0]
IRQ1/IRL1/PTH[1]
IRQ2/IRL2/PTH[2]
IRQ3/IRL3/PTH[3]
IRQ4/PTH[4]
DREQ0/PTH[5]
DREQ1/PTH[6]
AN[0]/PTJ[0]
AN[1]/PTJ[1]
AN[2]/DA[1]/PTJ[2]
AN[3]/DA[0]/PTJ[3]
TxD0/SCPT[0]
SCK0/SCPT[1]
TxD2/SCPT[2]
SCK2/SCPT[3]
RTS2/SCPT[4]
CTS2/IRQ5/SCPT[5]
RxD0/SCPT[0]
RxD2/SCPT[2]
MD5
MD4
MD3
MD2
MD1
MD0
XTAL
EXTAL
CKIO
RESETM
NMI
RESETP
CA
VccQ1
VssQ1
VccQ2
VssQ2
VccQ3
VssQ3
VccQ4
VssQ4
VccQ5
VssQ5
VccQ6
VssQ6
VccQ7
VssQ7
VccQ8
VssQ8
VccQ9
VssQ9
Vcc1
Vss1
Vcc2
Vss2
Vcc3
Vss3
Vcc4
Vss4
Vss
Vcc-PLL1
Vss-PLL1
CAP1
Vcc-PLL2
Vss-PLL2
CAP2
AVcc1
AVss1
AVss
A25
A24
A23
A22
A21
A20
A19
A18
A17
A16
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
D31/PTB[7]
D30/PTB[6]
D29/PTB[5]
D28/PTB[4]
D27/PTB[3]
D26/PTB[2]
D25/PTB[1]
D24/PTB[0]
D23/PTA[7]
D22/PTA[6]
D21/PTA[5]
D20/PTA[4]
D19/PTA[3]
D18/PTA[2]
D17/PTA[1]
D16/PTA[0]
D15
D14
D13
D12
D11
D10
D9
D8
D7
D6
D5
D4
D3
D2
D1
D0
RD
WE0/DQMLL
WE1/DQMLU/WE
RD/WR
BS/PTC[0]
WE2/DQMUL/ICIORD/PTC[1]
WE3/DQMUU/ICIOWR/PTC[2]
CS0
CS2/PTC[3]
CS3/PTC[4]
CS4/PTC[5]
CS5/CE1A/PTC[6]
CS6/CE1B/PTC[7]
RASL/PTD[0]
RASU/PTD[1]
CASL/PTD[2]
CASU/PTD[3]
CKE/PTD[4]
IOIS16/PTD[5]
CE2A/PTD[6]
CE2B/PTD[7]
BACK
BREQ
WAIT
DACK0/PTE[0]
DACK1/PTE[1]
DRAK0/PTE[2]
DRAK1/PTE[3]
STATUS0/PTE[4]
STATUS1/PTE[5]
TCLK/PTE[6]
IRQOUT/PTE[7]
Vcc-RTC
Vss-RTC
/RD
/WE0
/WE1
RD/WR
/BS
/DQMUL
/DQMUU
/CS0
/CS2
/CS3
/CS4
/CS6
/RASL
/CASL
CKE
CRNT0
CRNT1
/WAIT
/DACK0
/DACK1
/DRAK0
/DRAK1
(4-2A)(7-3B)(11-3D)
(2-2A)(4-2A)(7-3B)(11-3A)
(4-2D)(7-3B)(11-3D)
(2-3A)(3-1A)(4-5D)(7-3B)(11-3A)(12-3A)
(2-3A)(7-3B)(11-5D) (12-1A)(12-5I)
(4-4D)(11-3A)
(4-4D)(11-3D) (12-5A)
(11-4A)
(4-2A)(11-3A)
(4-4D)(11-3D)
(2-3A)(11-4D)
(7-3B)(11-4D)
(4-4D)(11-3A)
(4-5D)(11-3A)
(4-5D)
(6-5A)
(6-5A)
(2-3A)(7-3B)
(2-3A)
(2-4A)
(2-3A)
(2-4A)
/CS0J
(2-3A)
IC16C
IC16D
IC16E
IC16F
74LV14A
C247
0.1u
C71
C17
C21
C20
C25
C24
C22
C19
C238
C11
C16
C23
C13
C10
C14
C236
C15
C12
C18
R303
R335
R336
R301
R295
R332
R294
R297
R292
R422
R423
R61
R451
R452
R453
R449
R426
R425
R427
R450
R424
R341
R340
R339
R338
R337
R346
R345
R344
R347
R348
R349
R421
R420
R419
R418
R342
TP1
TP2
TP3
TP5
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP14
TP15
TP16
JP1
DEBUG
NORMAL
N.M.
SHADG
IADG
DG
+3.3V
+1.9VD
+3.3VSHA
Vcc-PLL
1.9VD
4.7K
10K
100
0
1u/6.3V
1u
470p
33
33 x4
BR34
BR35
BR36
BR37
BR38
BR39
BR21
BR17
BR20
BR16
BR19
BR15
BR18
BR14
R21
R17
R20
R16
R19
R15
R18
R14

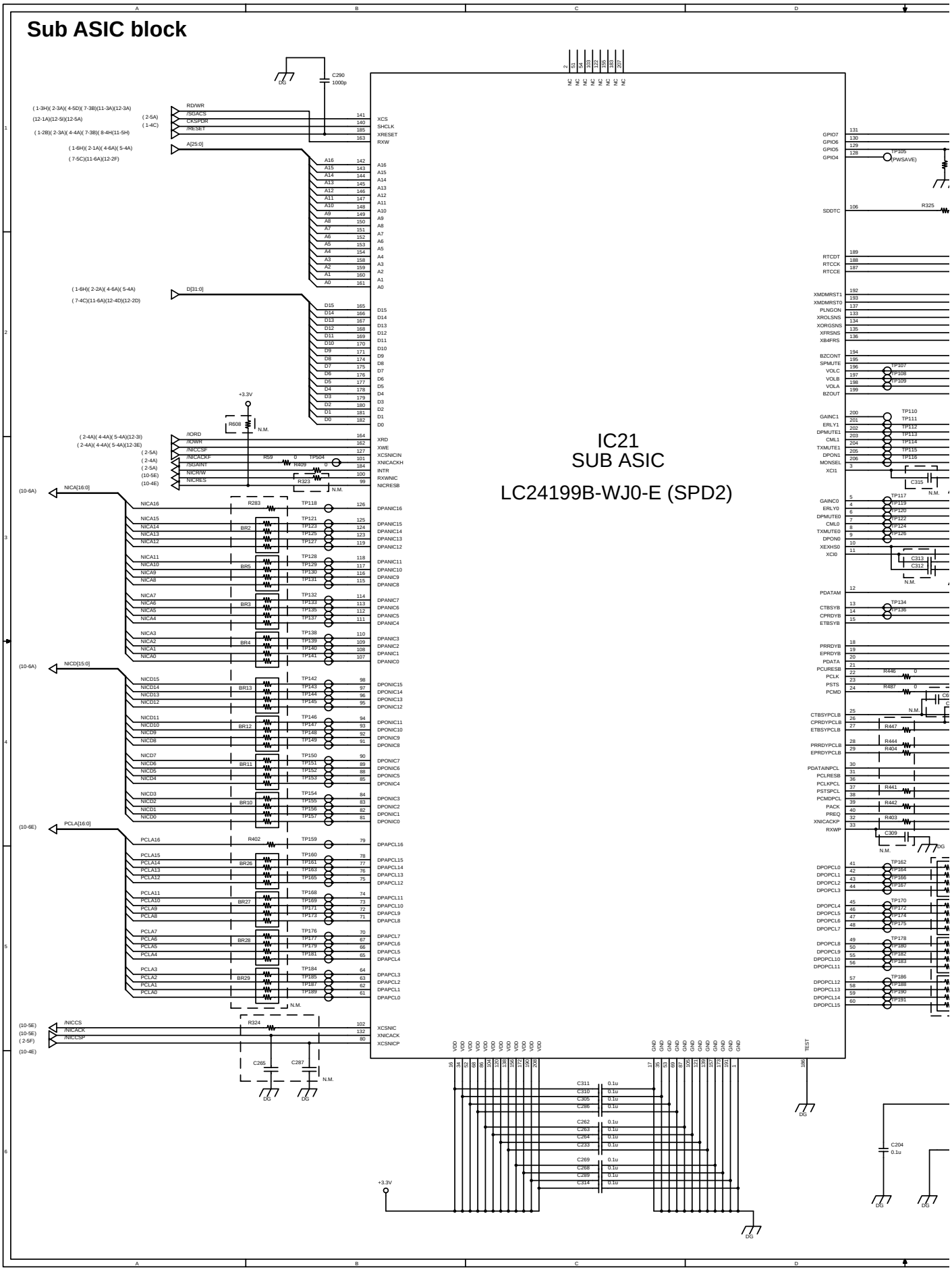
Main ASIC block



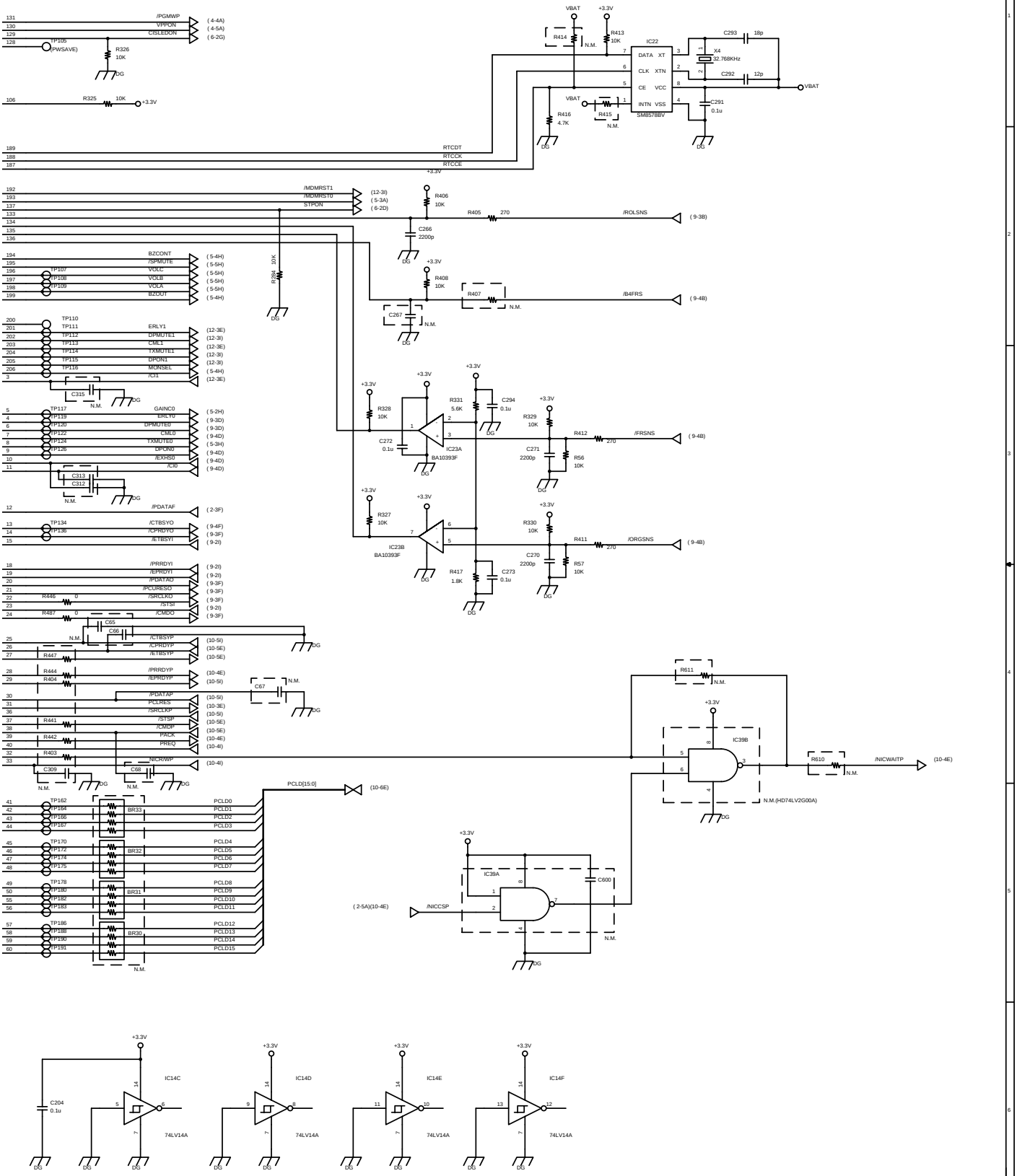
2/12

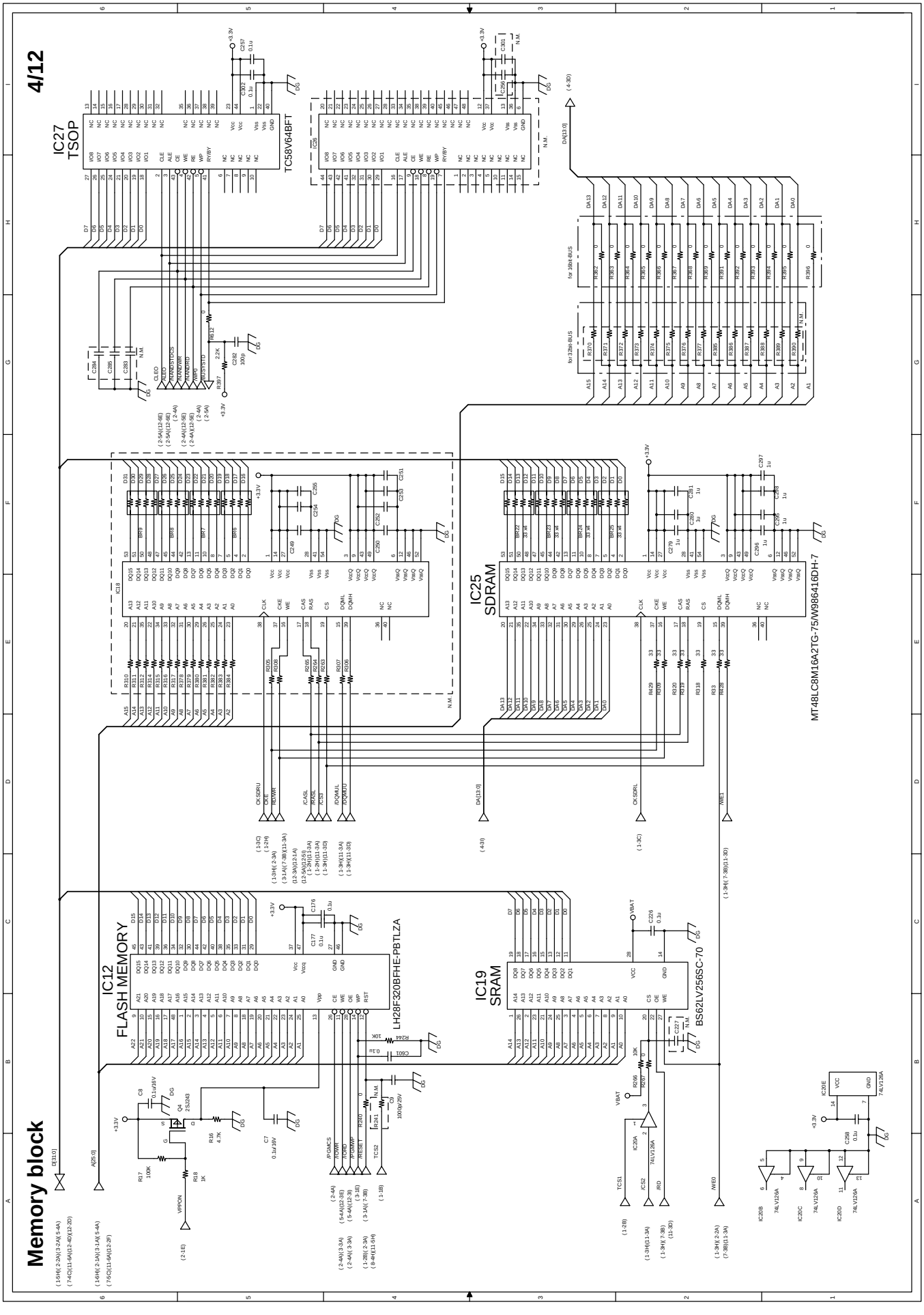

IC5 SDRAM
MT48LC4M16A2TG-75/
W986416DH-7
IC5
74HCT244 (TSSOP)
74HCT244 (SOP)
74LV14A
IC1
AD8051A
IC2
IC7
LDM[7:0]
SEN[7:0]
MA[13:0]
MD[15:0]
LD[7:0]
PLTSW
BKLON
CLK1
SH
SDCLK
SDCKE
/CAS
/RAS
/DWE
/CSDRM0
/DQMUL
/DQMLL
/TODF
/HSYNCP
/HSYNC
CISCLK
CISSI
LEDEN2
LEDEN1
RS
E
ENA
ENB
TXPA
TXA1
TXB0
TXA0
TXB1
TXPB
AO
N.M.
N.M.(2SA1037KR)

Sub ASIC block

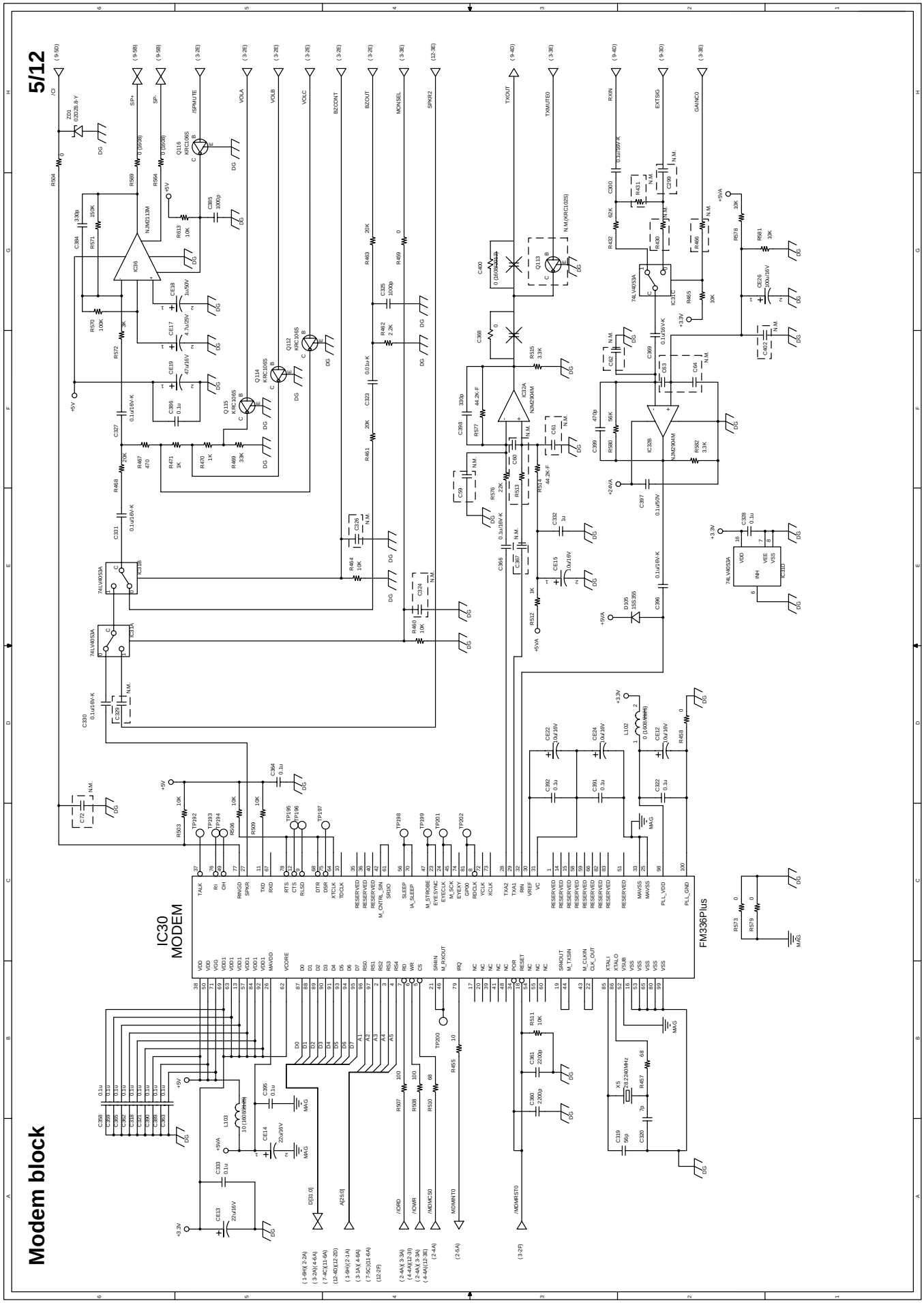


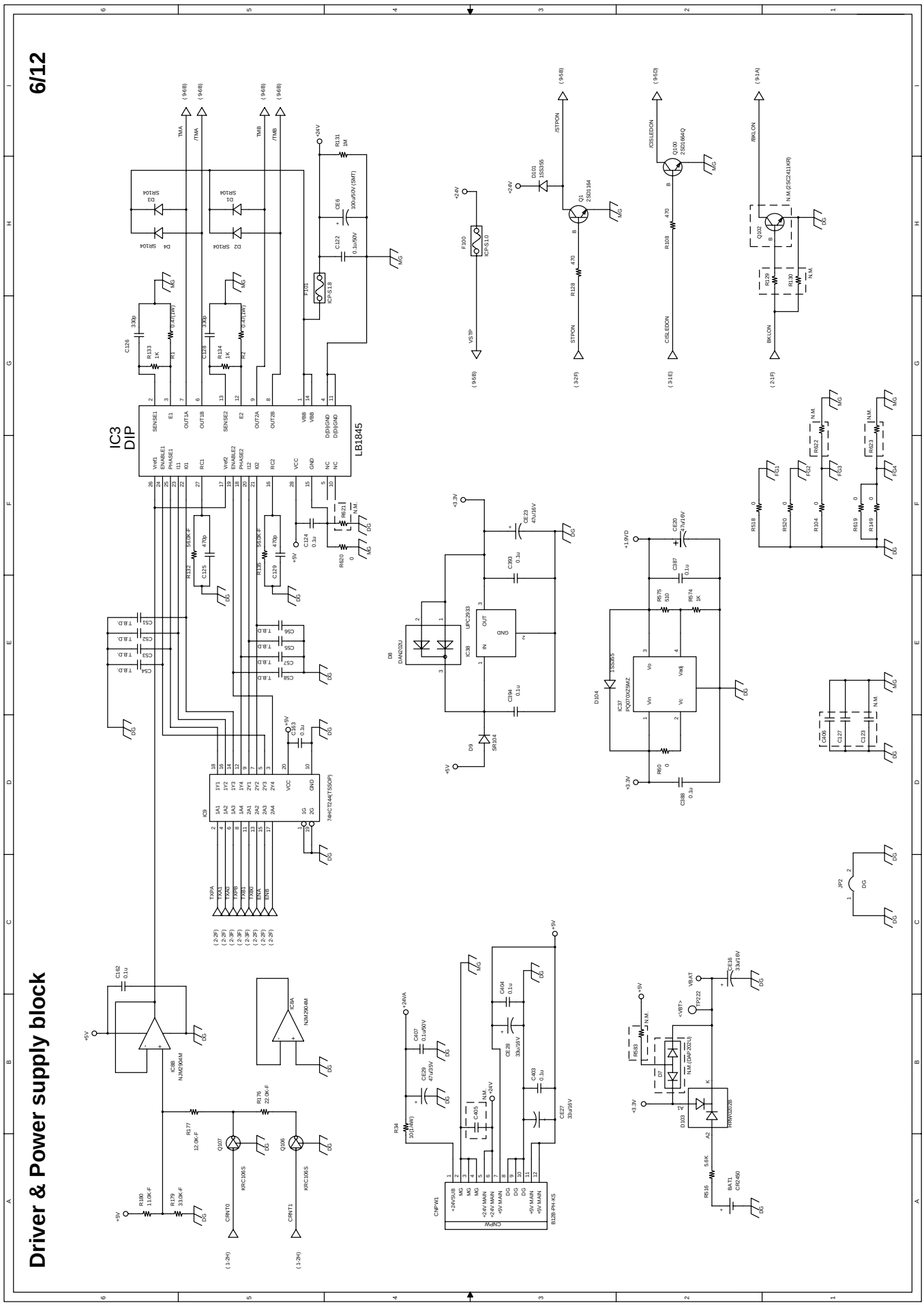
3/12


/PGMWP
VPPON
CISLEDON
(4-4A)
(4-5A)
(6-2G)
TP105
(PWSAVE)
R326
10K
R325
10K
+3.3V
VBAT
R414
N.M.
R413
10K
IC22
DATA XT
CLK XTN
CE VCC
INTN VSS
SM8578BV
X4
32.768KHz
C293
18p
C292
12p
C291
0.1u
R415
N.M.
R416
4.7K
RTCDT
RTCCK
RTCCE
/MDMRST1
/MDMRST0
STPON
(12-3I)
(5-3A)
(6-2D)
R406
10K
R405
270
/ROLSNS
(9-3B)
C266
2200p
R408
10K
R407
N.M.
/B4FRS
(9-4B)
C267
N.M.
R284
10K
BZCONT
/SPMUTE
VOLC
VOLB
VOLA
BZOUT
(5-4H)
TP107
TP108
TP109
TP110
TP111
TP112
TP113
TP114
TP115
TP116
ERLY1
DPMUTE1
CML1
TXMUTE1
DPON1
MONSEL
/CI1
(12-3E)
(12-3I)
(12-3E)
(12-3I)
(12-3I)
(5-4H)
(12-3E)
C315
N.M.
TP117
TP119
TP120
TP122
TP124
TP126
GAINC0
ERLY0
DPMUTE0
CML0
TXMUTE0
DPON0
/EXHS0
/CI0
(5-2H)
(9-3D)
(9-3D)
(9-4D)
(5-3H)
(9-4D)
(9-4D)
(9-4D)
C313
C312
N.M.
/PDATAF
(2-3F)
TP134
TP136
/CTBSYO
/CPRDYO
/ETBSYI
(9-4F)
(9-3F)
(9-2I)
/PRRDYI
/EPRDYI
/PDATAI
/PCURESO
/SRCLKO
/STSI
/CMDO
(9-2I)
(9-2I)
(9-3F)
(9-3F)
(9-3F)
(9-2I)
(9-3F)
R446
R487
C65
C66
N.M.
/CTBSYP
/CPRDYP
/ETBSYP
(10-5I)
(10-5E)
(10-5E)
R447
R444
R404
/PRRDYP
/EPRDYP
(10-4E)
(10-5I)
C67
N.M.
/PDATAP
PCLRES
/SRCLKP
/STSP
/CMDP
PACK
PREQ
(10-5I)
(10-3E)
(10-5I)
(10-5E)
(10-5E)
(10-4E)
(10-4I)
R441
R442
R403
/NICR/WP
(10-4I)
C309
C68
N.M.
N.M.
PCLD[15:0]
(10-6E)
TP162
TP164
TP166
TP167
TP170
TP172
TP174
TP175
TP178
TP180
TP182
TP183
TP186
TP188
TP190
TP191
BR33
BR32
BR31
BR30
PCLD0
PCLD1
PCLD2
PCLD3
PCLD4
PCLD5
PCLD6
PCLD7
PCLD8
PCLD9
PCLD10
PCLD11
PCLD12
PCLD13
PCLD14
PCLD15
N.M.
R328
10K
R331
5.6K
C294
0.1u
IC23A
BA10393F
C272
0.1u
R329
10K
R412
270
/FRSNS
(9-4B)
C271
2200p
R56
10K
R327
10K
IC23B
BA10393F
R417
1.8K
C273
0.1u
R330
10K
R411
270
/ORGSNS
(9-4B)
C270
2200p
R57
10K
R611
N.M.
IC39B
R610
N.M.
/NICWAITP
(10-4E)
N.M.(HD74LV2G00A)
IC39A
C600
N.M.
(2-5A)(10-4E)
/NICCSP
IC14C
IC14D
IC14E
IC14F
C204
0.1u
74LV14A


4/12
Memory block
IC27
TSOP
TC58V64BFT
IC25
SDRAM
MT48LC8M16A2TG-75/W986416DH-7
IC12
FLASH MEMORY
LH28F320BFHE-PBTLZA
IC19
SRAM
BS62LV256SC-70
for 16bit BUS
for 32bit BUS
N.M.

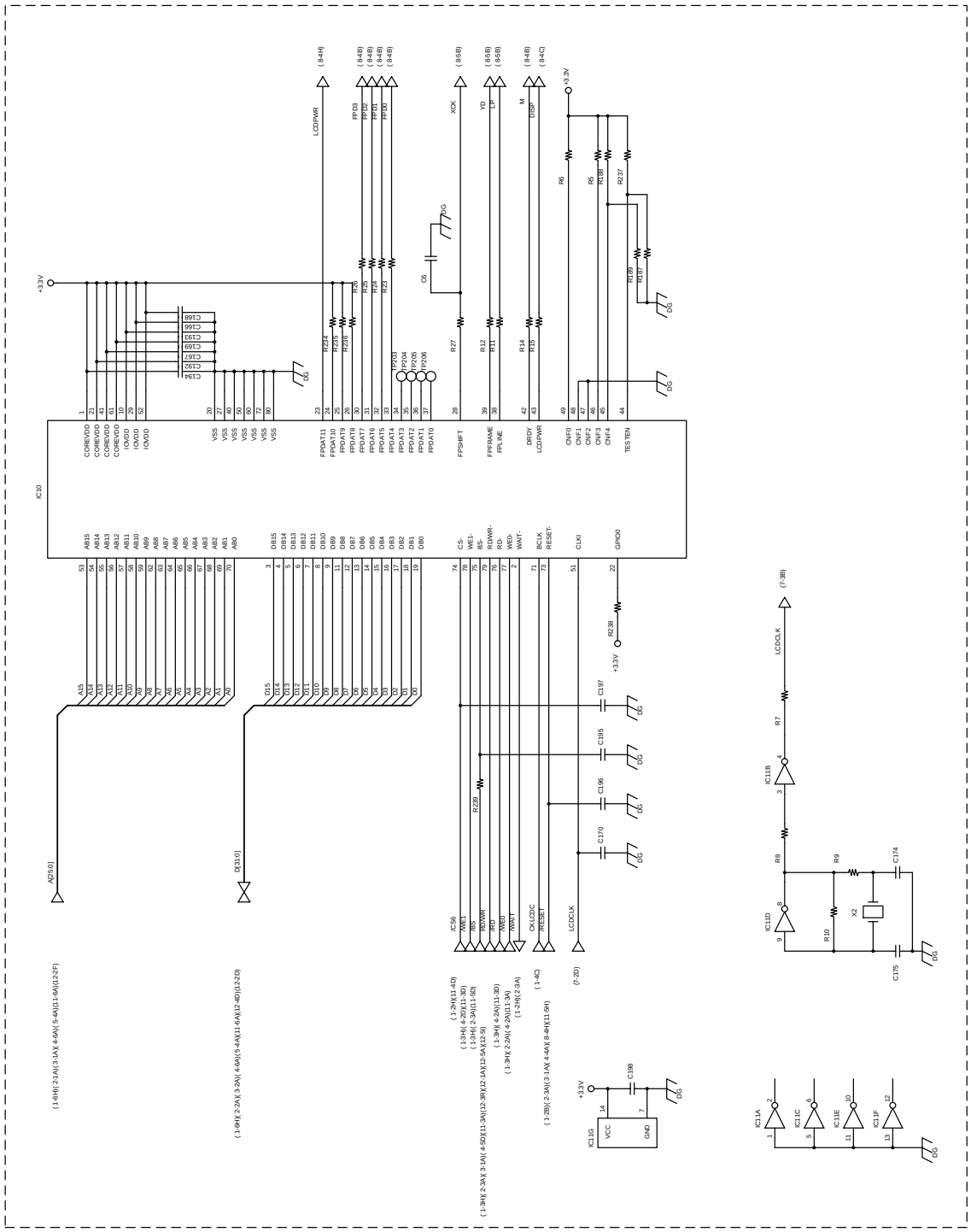
Modem block




6/12
Driver & Power supply block
IC3
DIP
LB1845
IC9
74HCT244(TSSOP)
IC88
NJM2904M
IC89
NJM2904M
IC38
UPC2933
IC37
PQ070XZ5MZ
D104
1SS355
D8
DAN202U
D9
SR104
D1
SR104
D2
SR104
D3
SR104
D4
SR104
D101
1SS355
Q1
2SB1184
Q100
2SD1664Q
Q102
2SC4116(R)
Q107
KRC106S
Q106
KRC106S
D103
HRKV0028
D7
N.M.(DAP202U)
IC4
CNPW1
B12B-PH-KS
F100
ICPS1.0
F101
ICPS1.0
JP2
TP222
VSTP
STPON
/STPON
/CSLEDON
BKLON
/BKLON
CRMT0
CRMT1
TXPA
TXPB
TXA1
TXA0
TXB1
TXB0
ENA
ENB
+24V
+5V
+3.3V
+1.8VD
VBAT
<VBT>
BAT1
CR2450
GND
VCC
VSS
Vo
Vin
Vc
Vout
OUT
IN
SENSE1
SENSE2
OUT1A
OUT1B
OUT2A
OUT2B
VBB
D/D/GND
Vref1
Vref2
ENABLE1
ENABLE2
PHASE1
PHASE2
I01
I02
I11
I12
RC1
RC2
NC
N.M.
T.B.D.

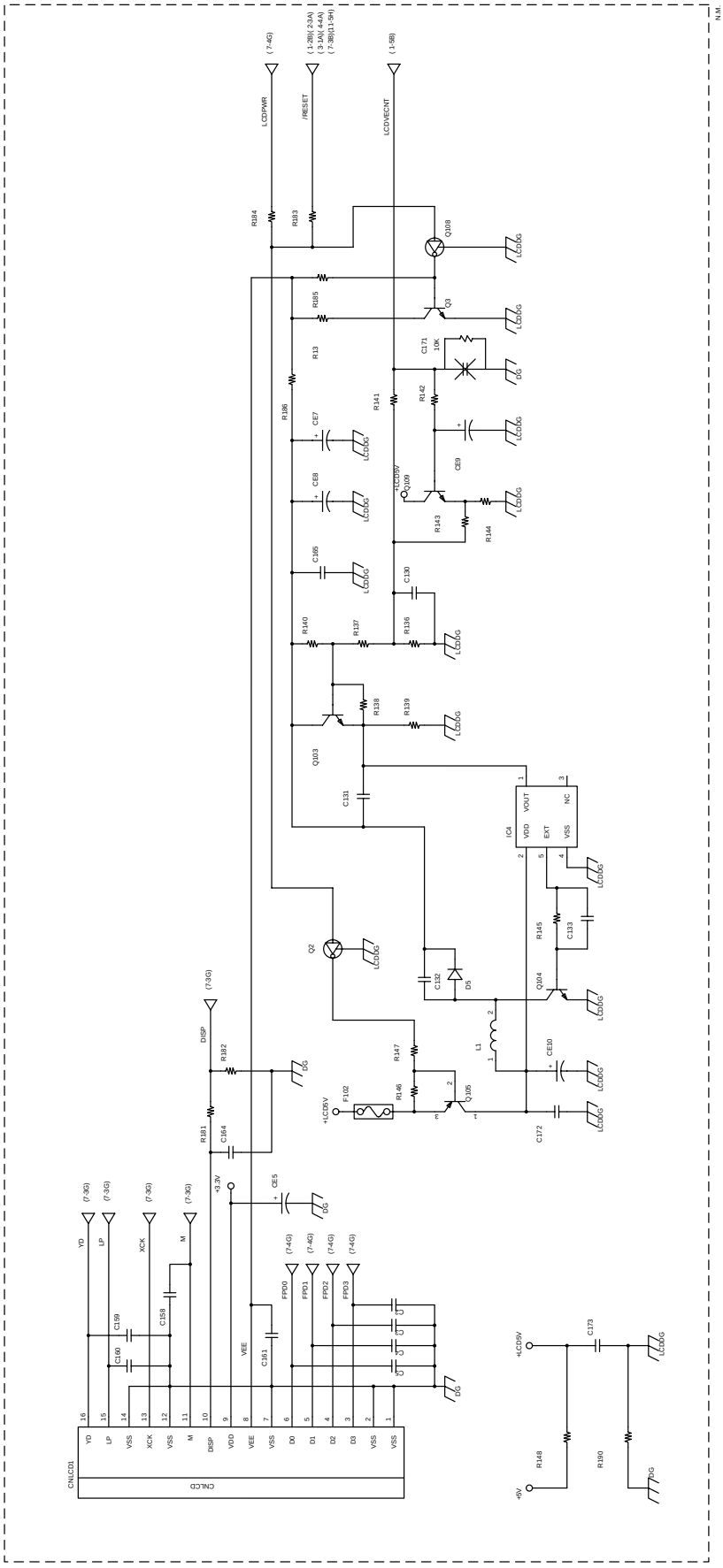
7/12

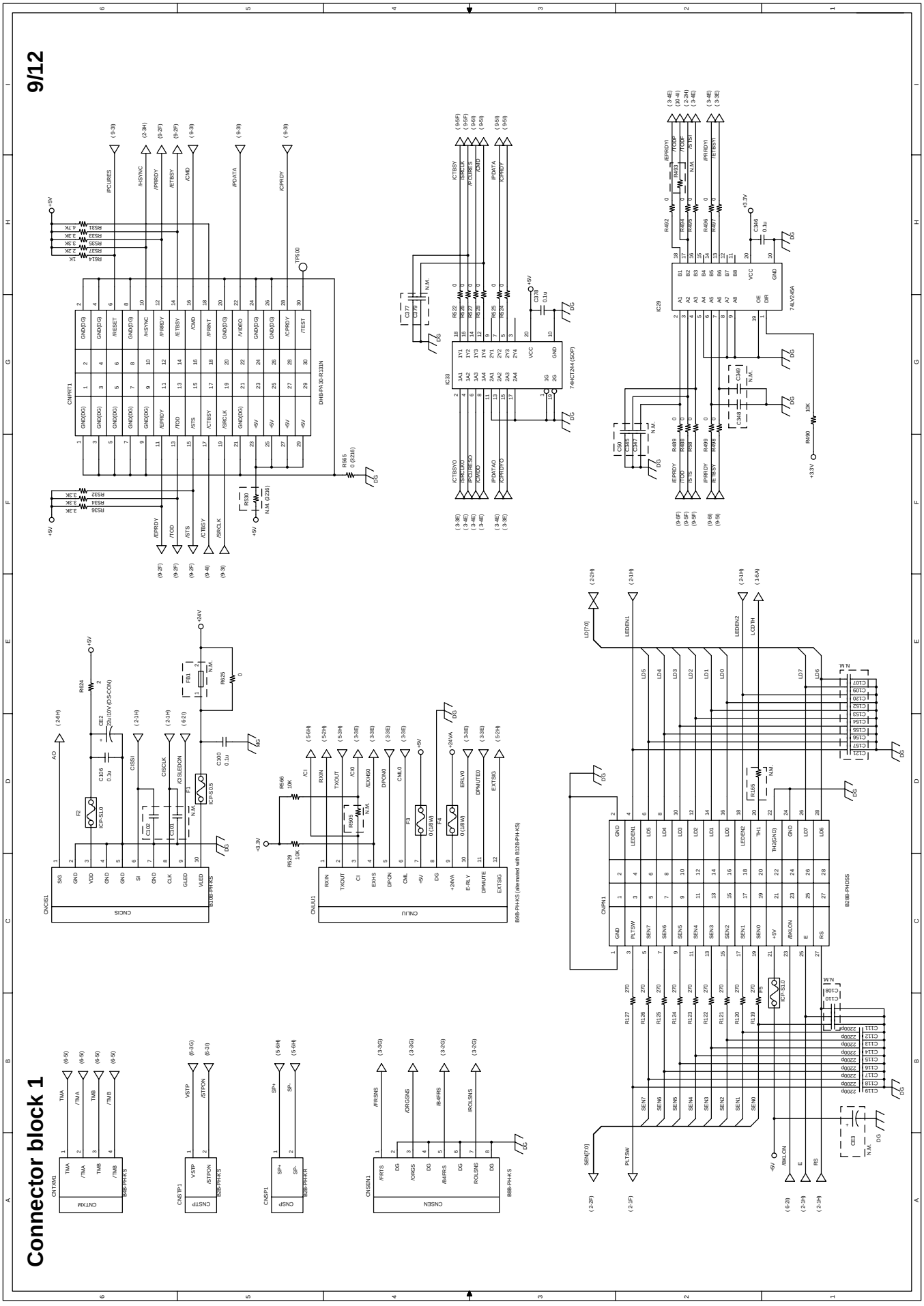
LCD controller block

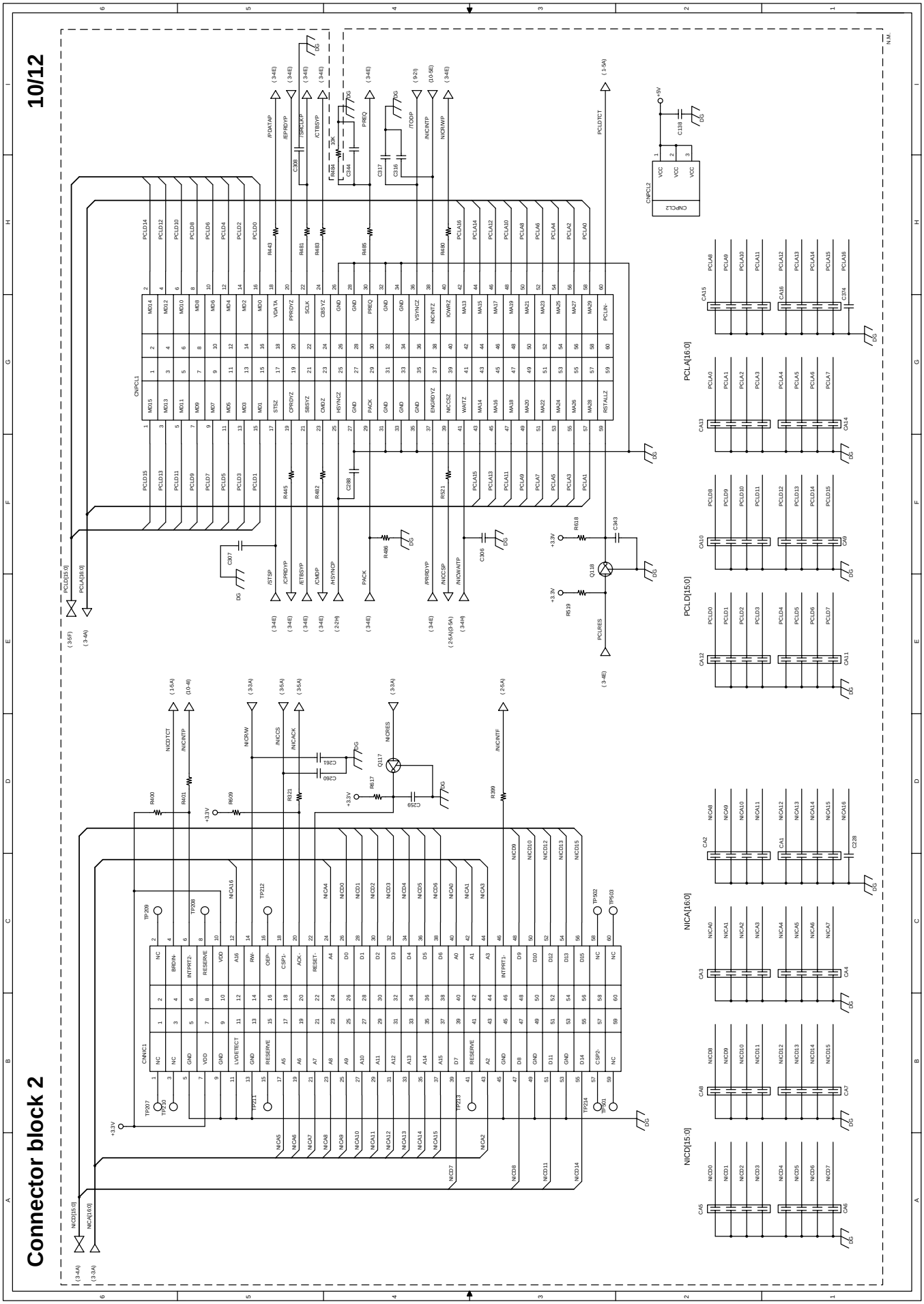


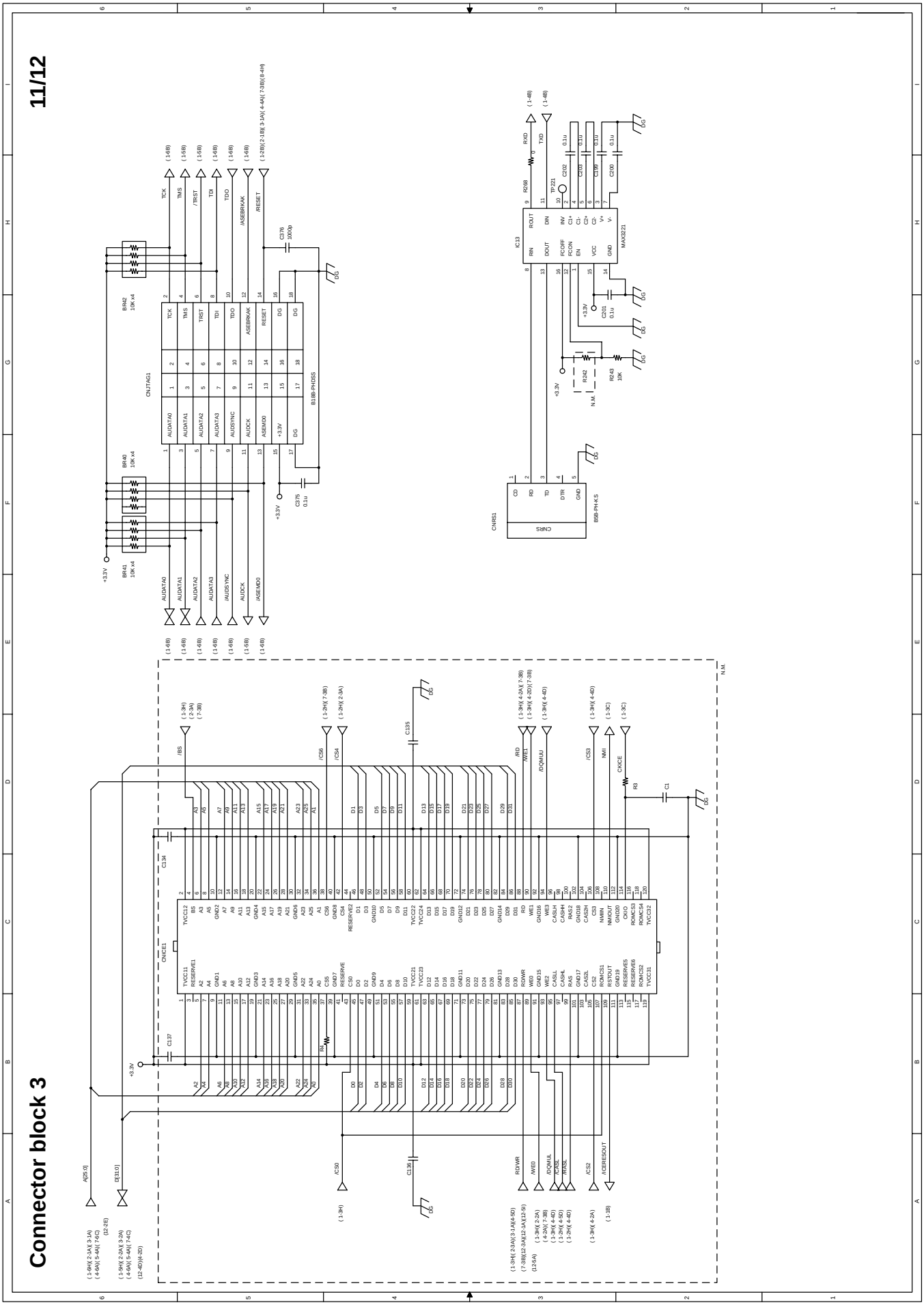
8/12

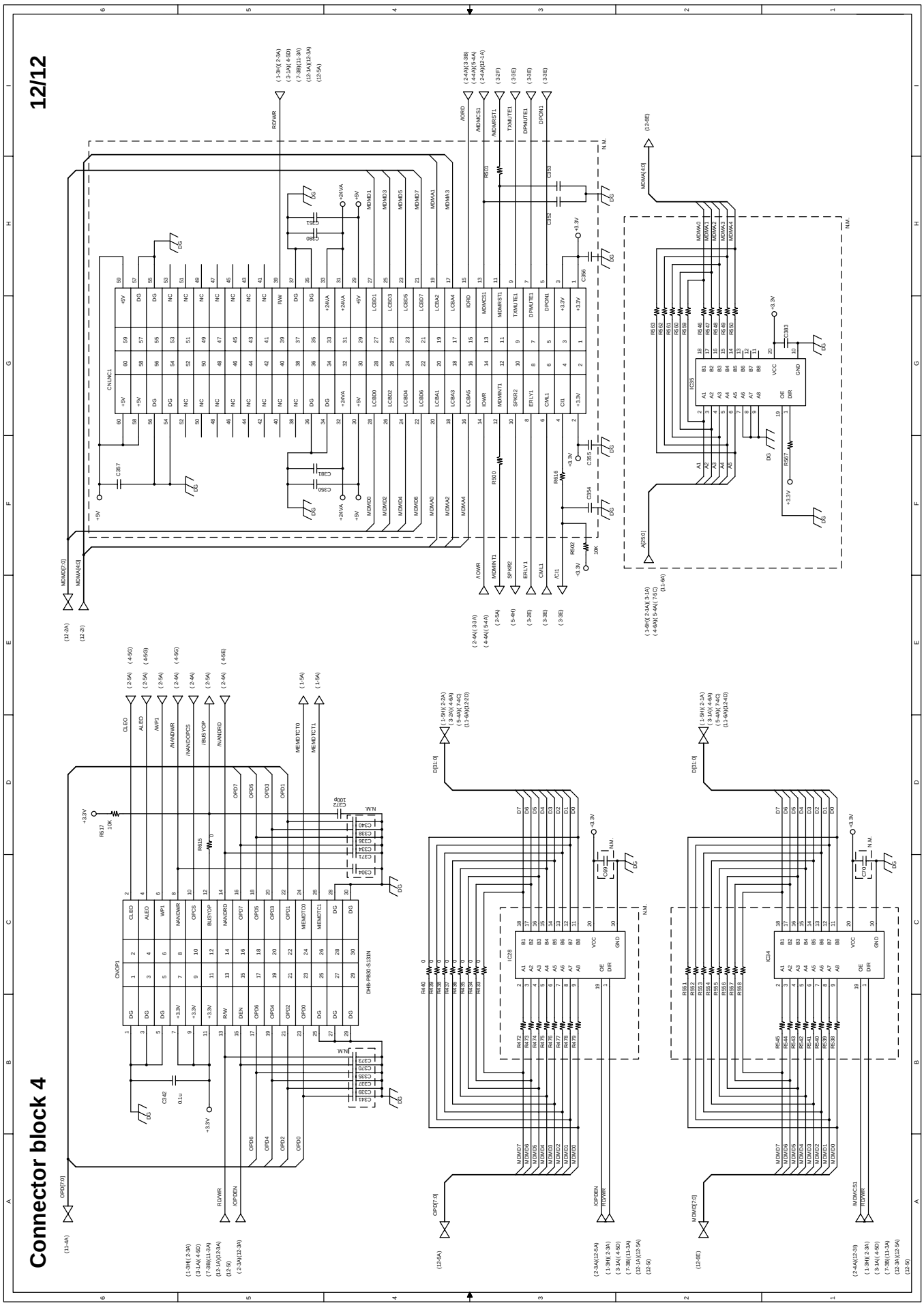
LCD power control block



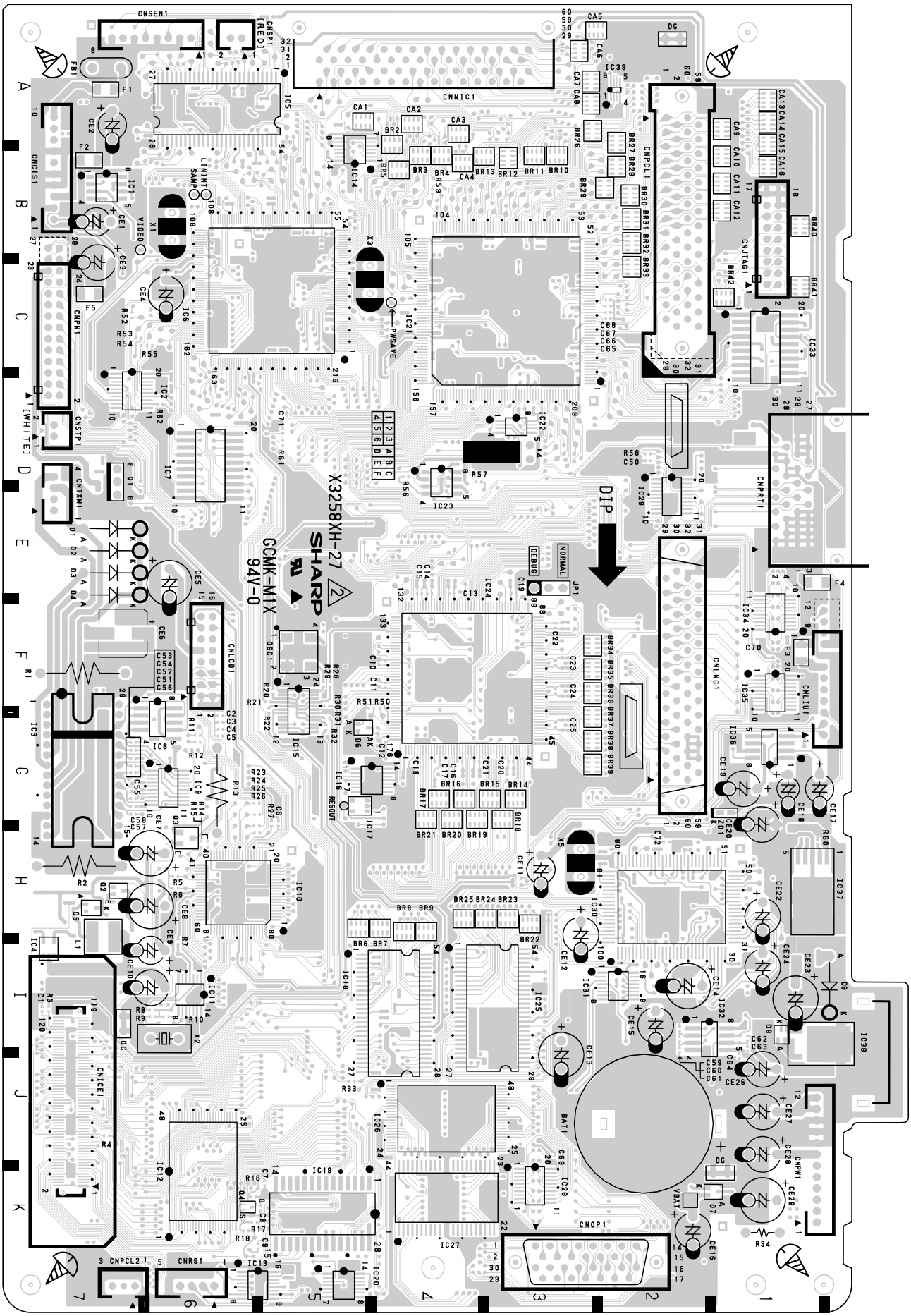

9/12
Connector block 1


Connector block 2
10/12

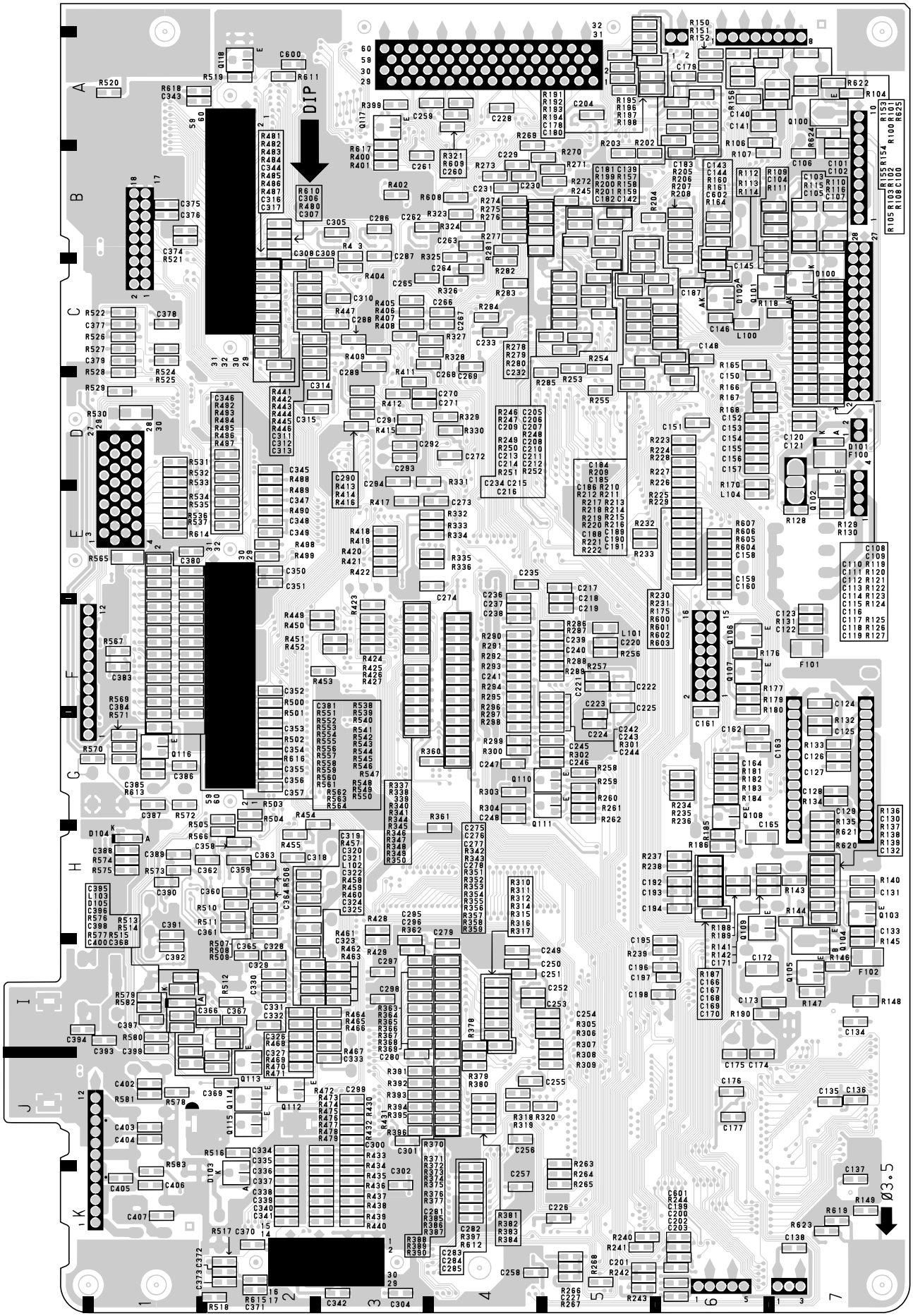

11/12
Connector block 3
CNJTAG1
CNCE1
IC13
MAX3221
CNRS1
CNRS
B5B-PH-K-S
B13B-PHDSS
BR40 10K x4
BR41 10K x4
BR42 10K x4
R242
R243 10K
R238
R3
C1
C134
C135
C136
C137
C376 1000p
C373 0.1u
C201 0.1u
C202 0.1u
C203 0.1u
C199 0.1u
C200 0.1u
TP221
+3.3V
DG
N.M.
TCK
TMS
/TRST
TDI
TDO
/ASEBRKAK
/RESET
AUDATA0
AUDATA1
AUDATA2
AUDATA3
/AUDSYNC
AUDCK
/ASEMD0
/BS
/CS6
/CS4
/CS3
/CS0
/CS2
/CS1
/RD
/WE1
/DQMUU
/DQMUL
/CASU
/CASL
/RAS
/WE0
/NMI
CKIOCE
RXD
TXD
A[25:0]
D[31:0]

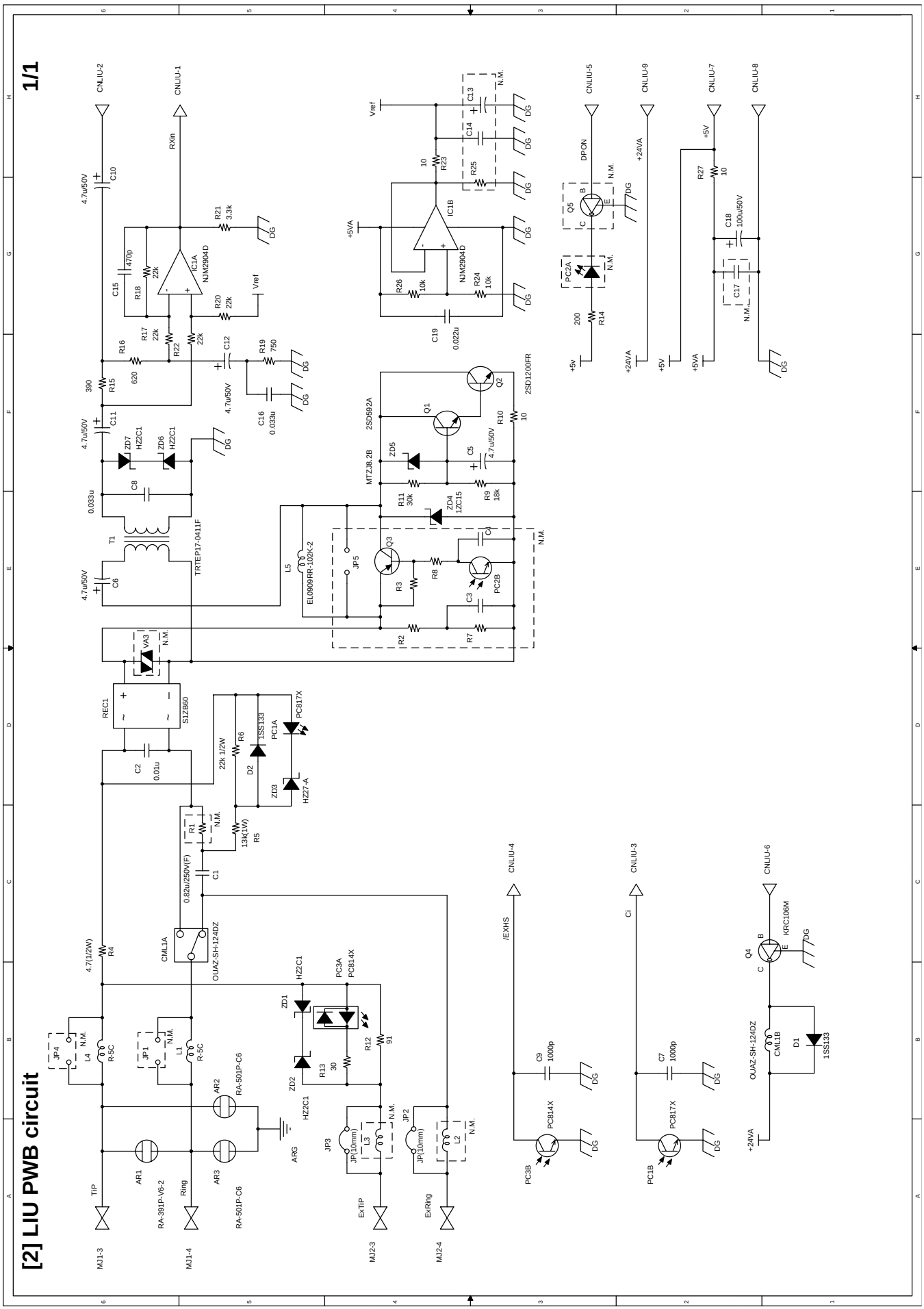

12/12
Connector block 4

Control PWB parts layout (Top side)

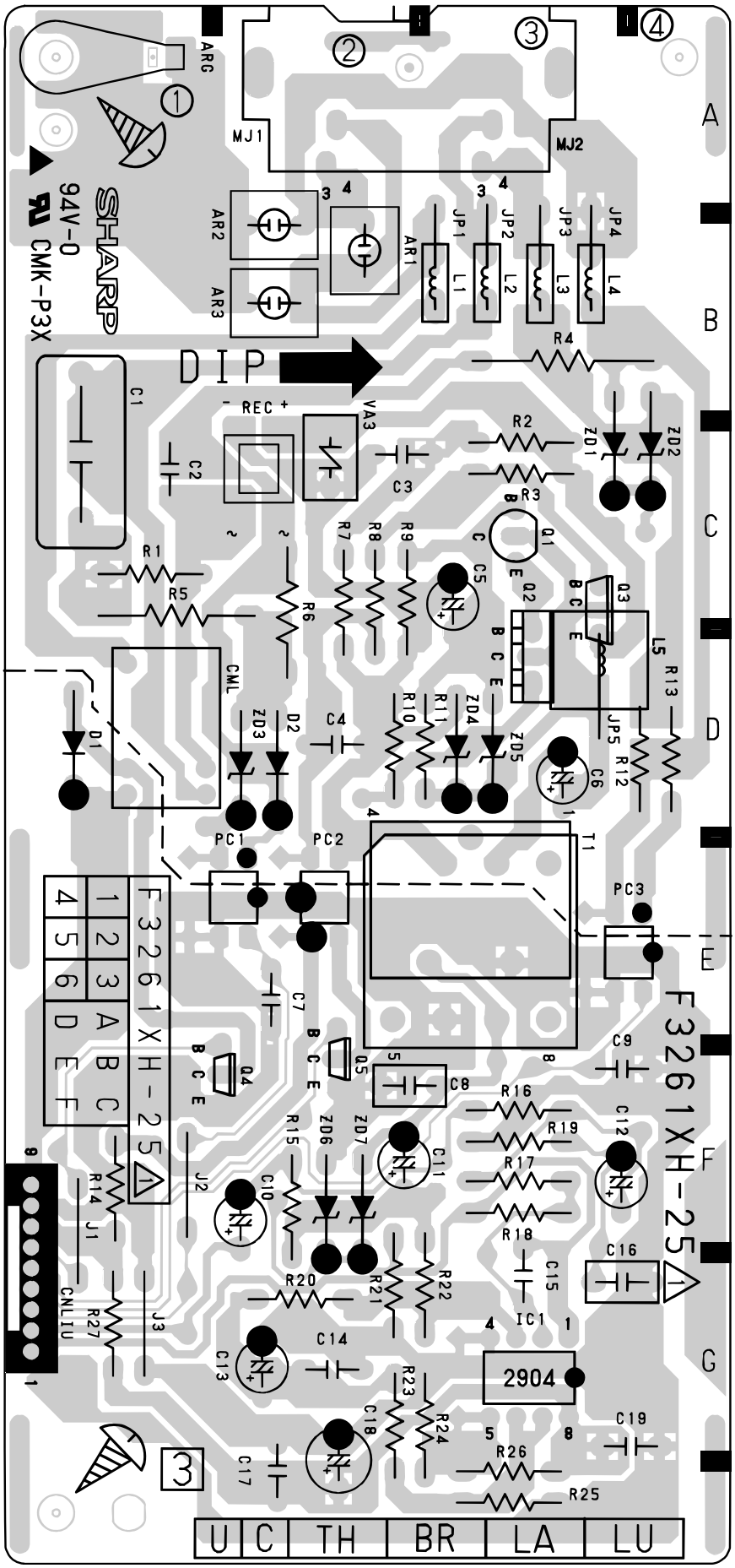


Control PWB parts layout (Bottom side)

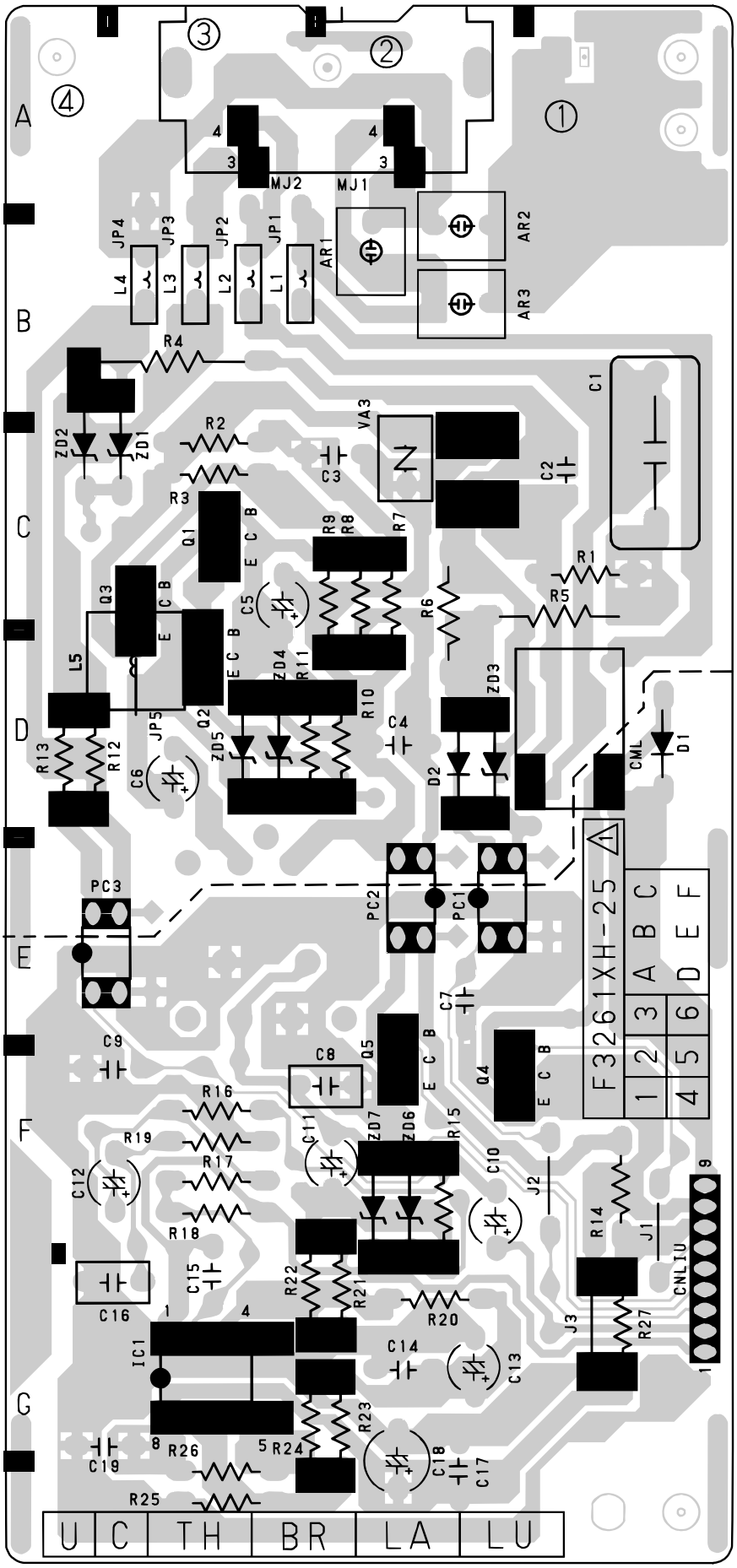


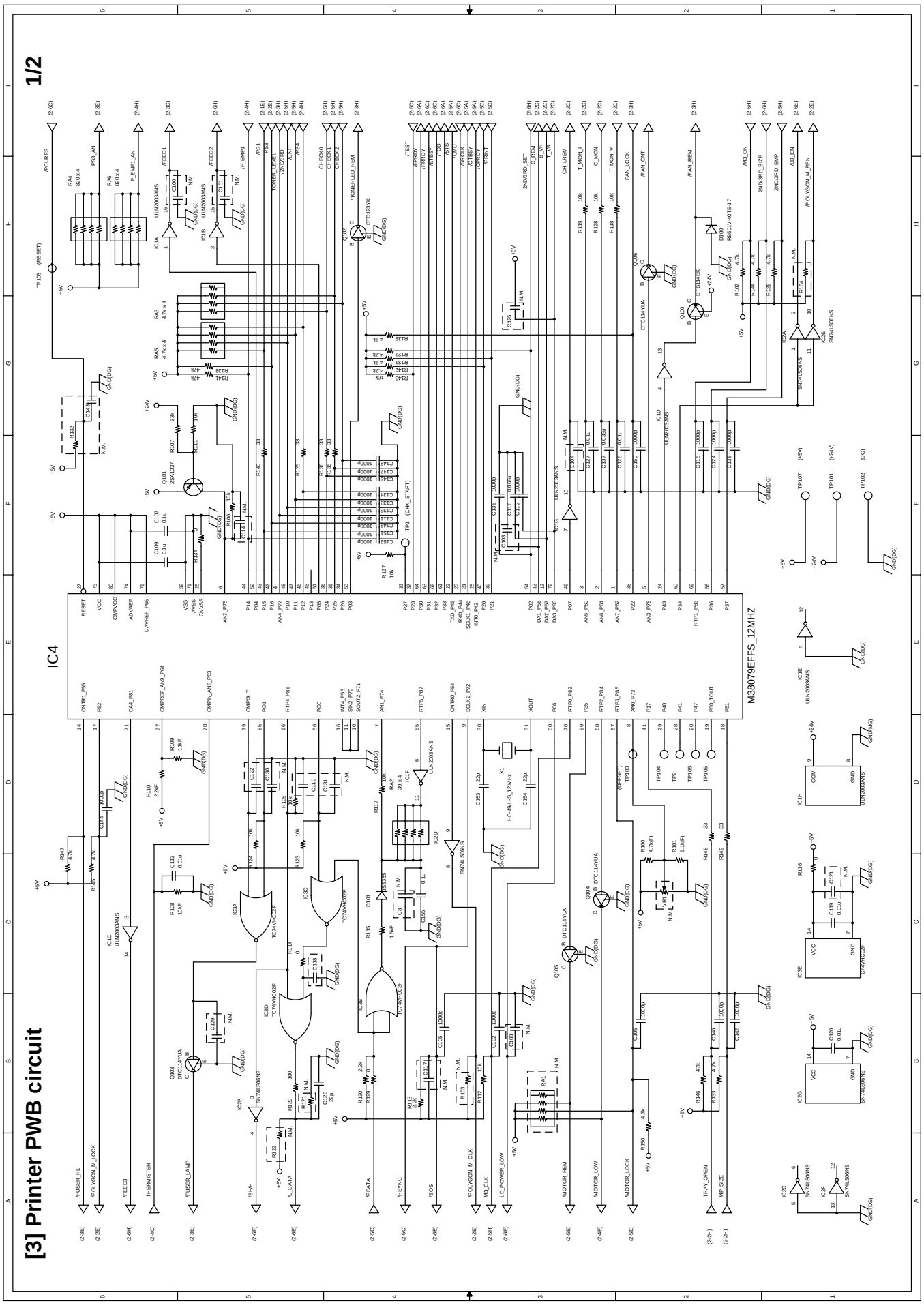

[2] LIU PWB circuit
1/1
CNLIU-1
CNLIU-2
CNLIU-3
CNLIU-4
CNLIU-5
CNLIU-6
CNLIU-7
CNLIU-8
CNLIU-9
TRTEP17-0411F
EL0909RR-102K-2
S1ZB60
OUAZ-SH-124DZ
NJM2904D
2SD592A
2SD1200FR
KRC106M
1SS133
PC817X
PC814X
PC1A
PC2A
PC2B
PC3A
PC3B
PC1B
RA-391P-V6-2
RA-501P-C6
R-5C
TiP
Ring
ExTiP
ExRing
ARG
Vref
RXin
/EXHS
DPON
+5V
+5VA
+24VA
DG

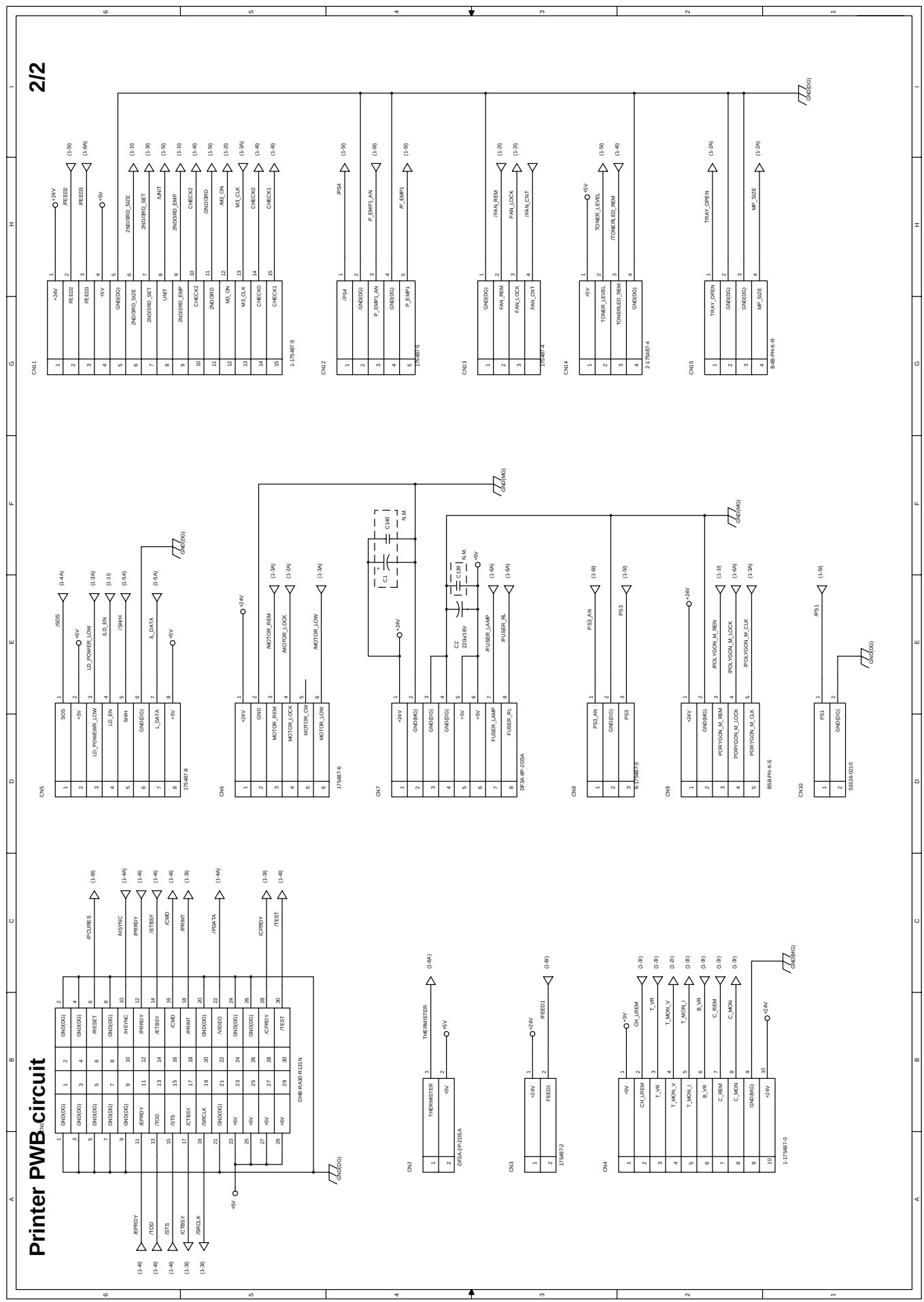
LIU PWB parts layout (Top side)



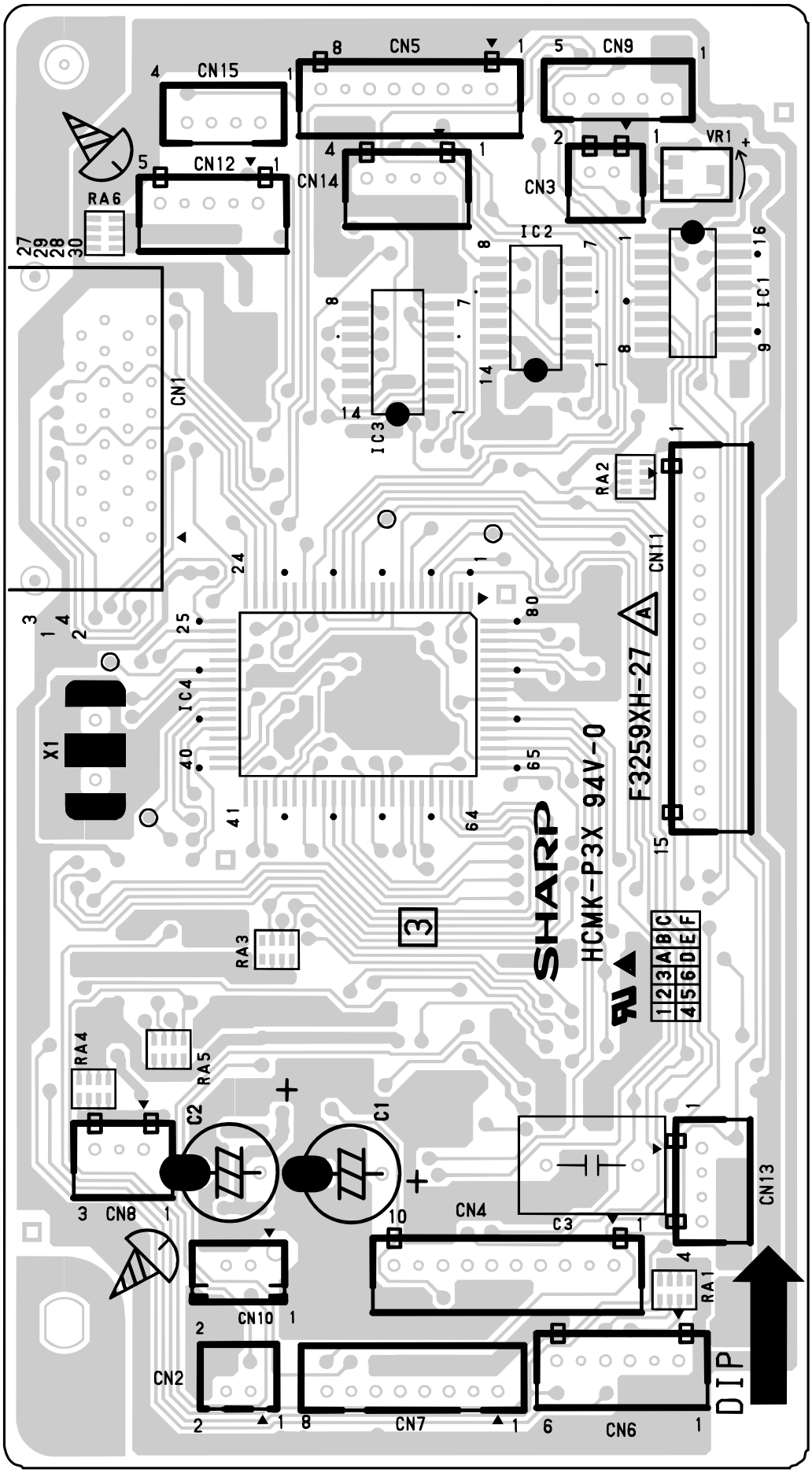
LIU PWB parts layout (Bottom side)



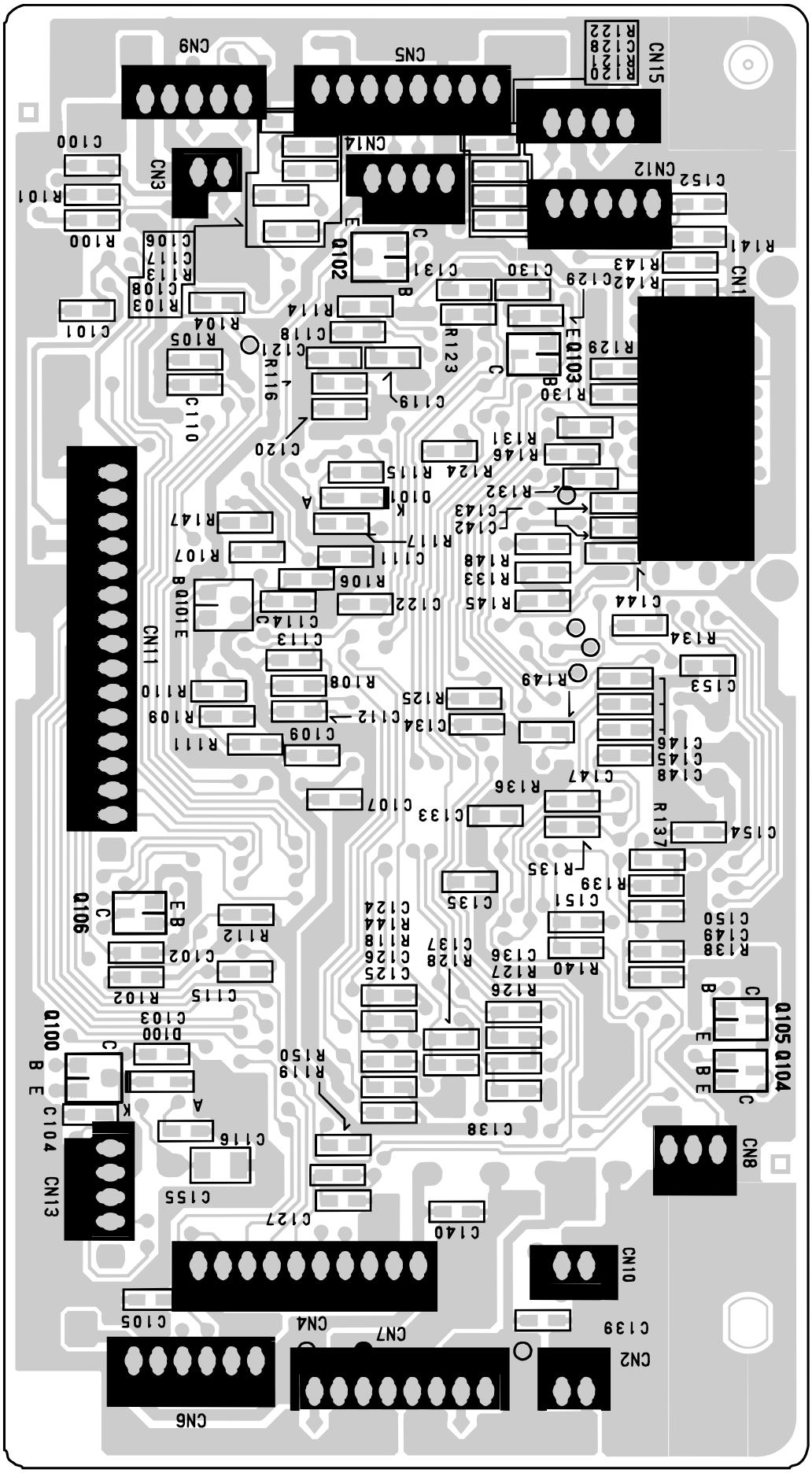

[3] Printer PWB circuit
1/2
IC4
M38079EFFS_12MHZ


2/2
Printer PWB circuit
CN11
CN12
CN13
CN14
CN15
CN5
CN6
CN7
CN8
CN9
CN10
CN2
CN3
CN4
DHB-RA30-R121N
DF3A-2P-2DSA
DF3A-8P-2DSA
B-175487-3
1-175487-5
2-175487-4
B-4B-PH-K-R
B5B-PH-K-S
S3P-SH-2D10
1-175487-0

Printer PWB parts layout (Top side)

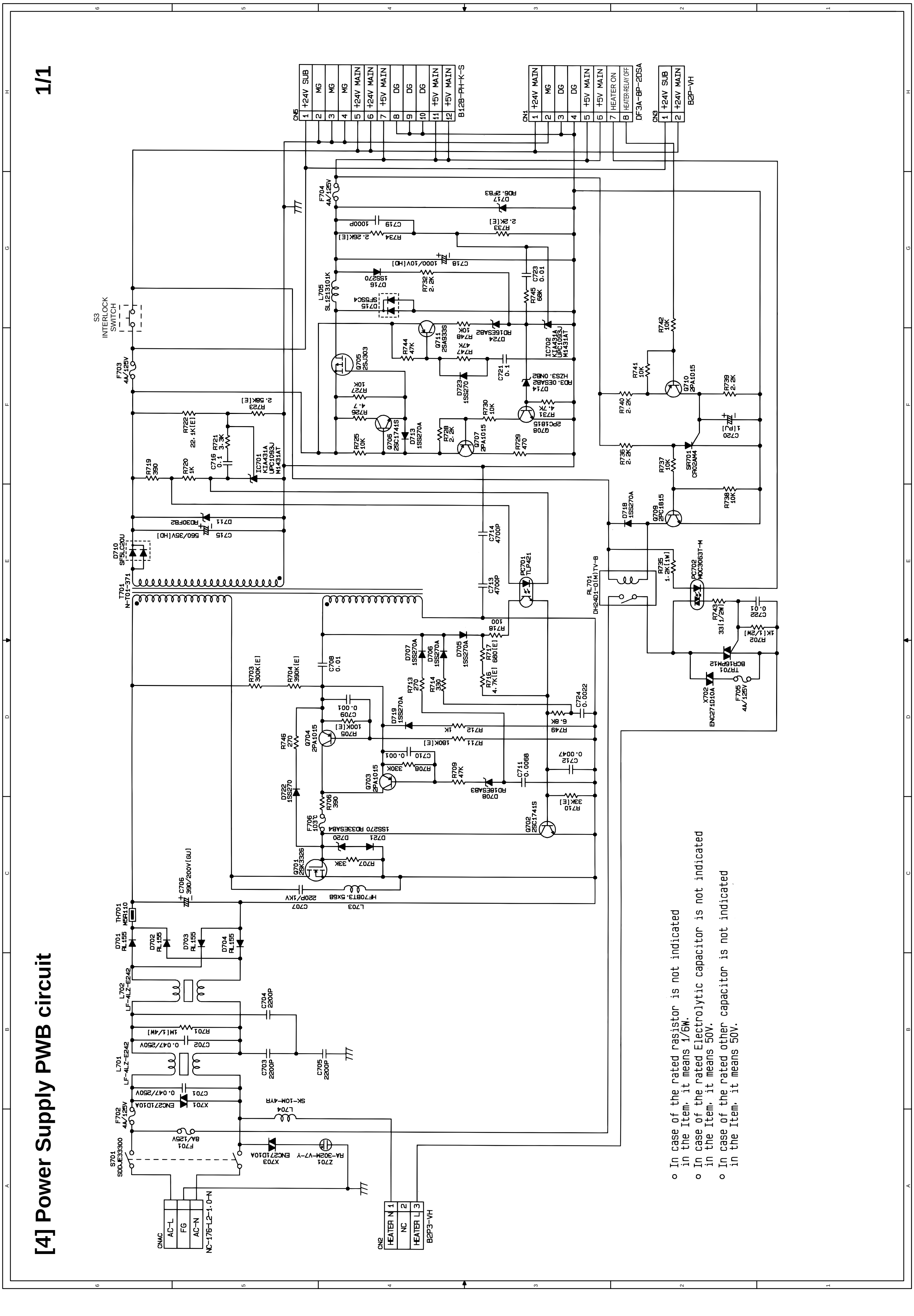


Printer PWB parts layout (Bottom side)



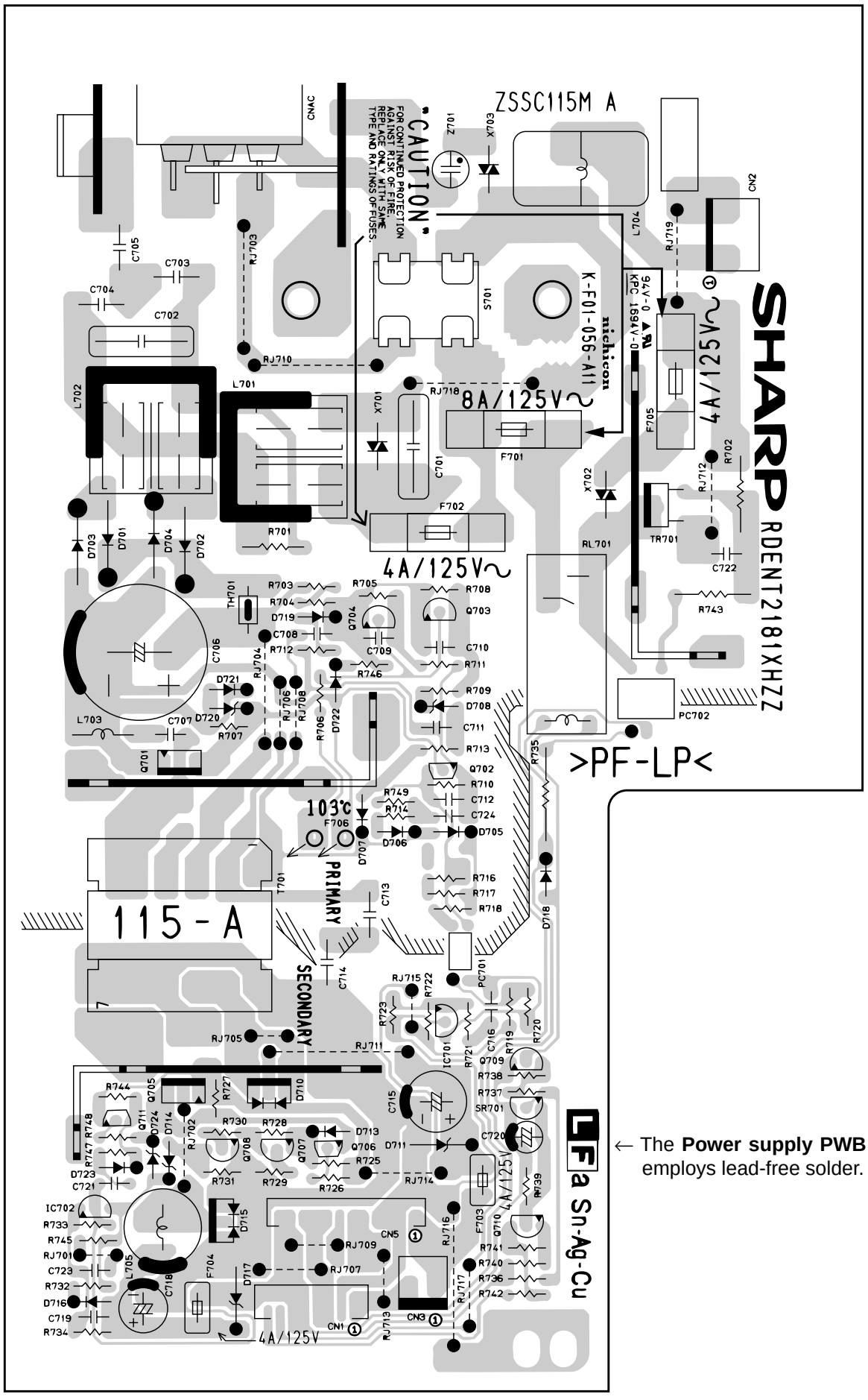
[4] Power Supply PWB circuit

1/1



- In case of the rated rasistor is not indicated in the Item, it means 1/6W.
- In case of the rated Electrolytic capacitor is not indicated in the Item, it means 50V.
- In case of the rated other capacitor is not indicated in the Item, it means 50V.

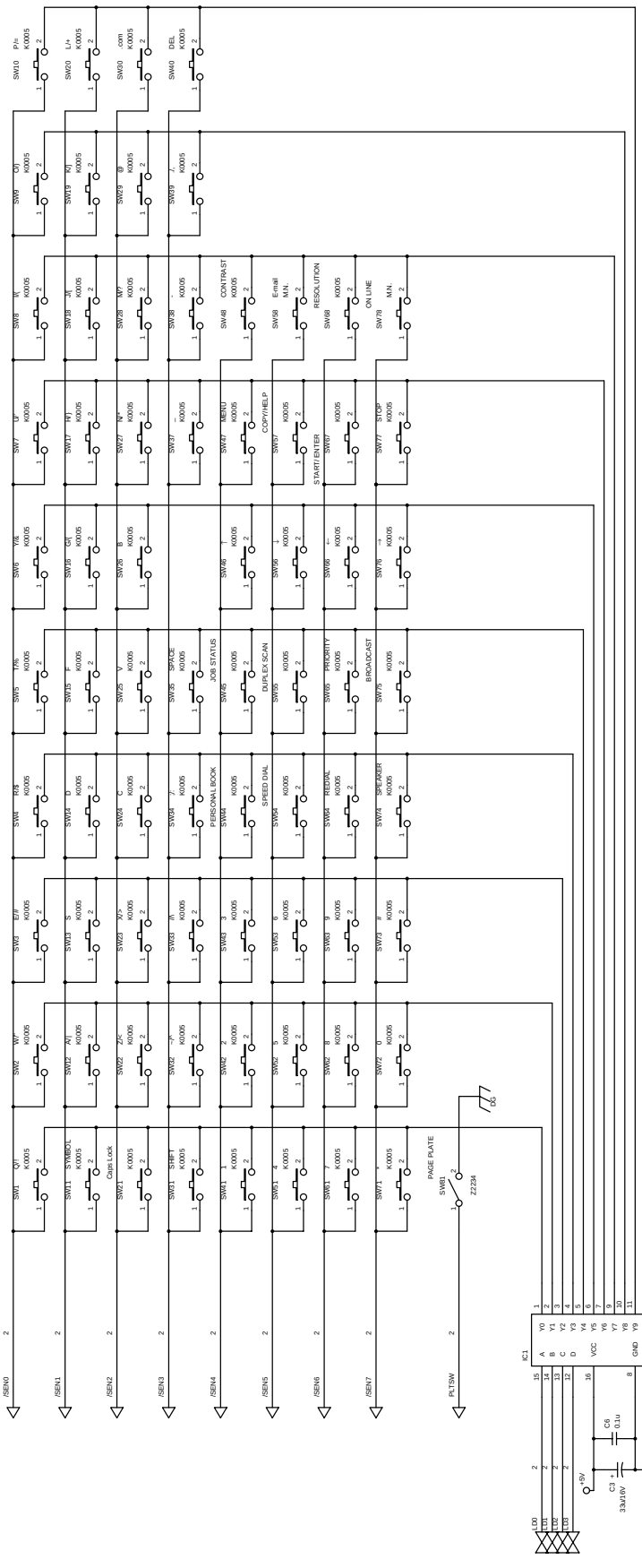
Power Supply PWB parts layout



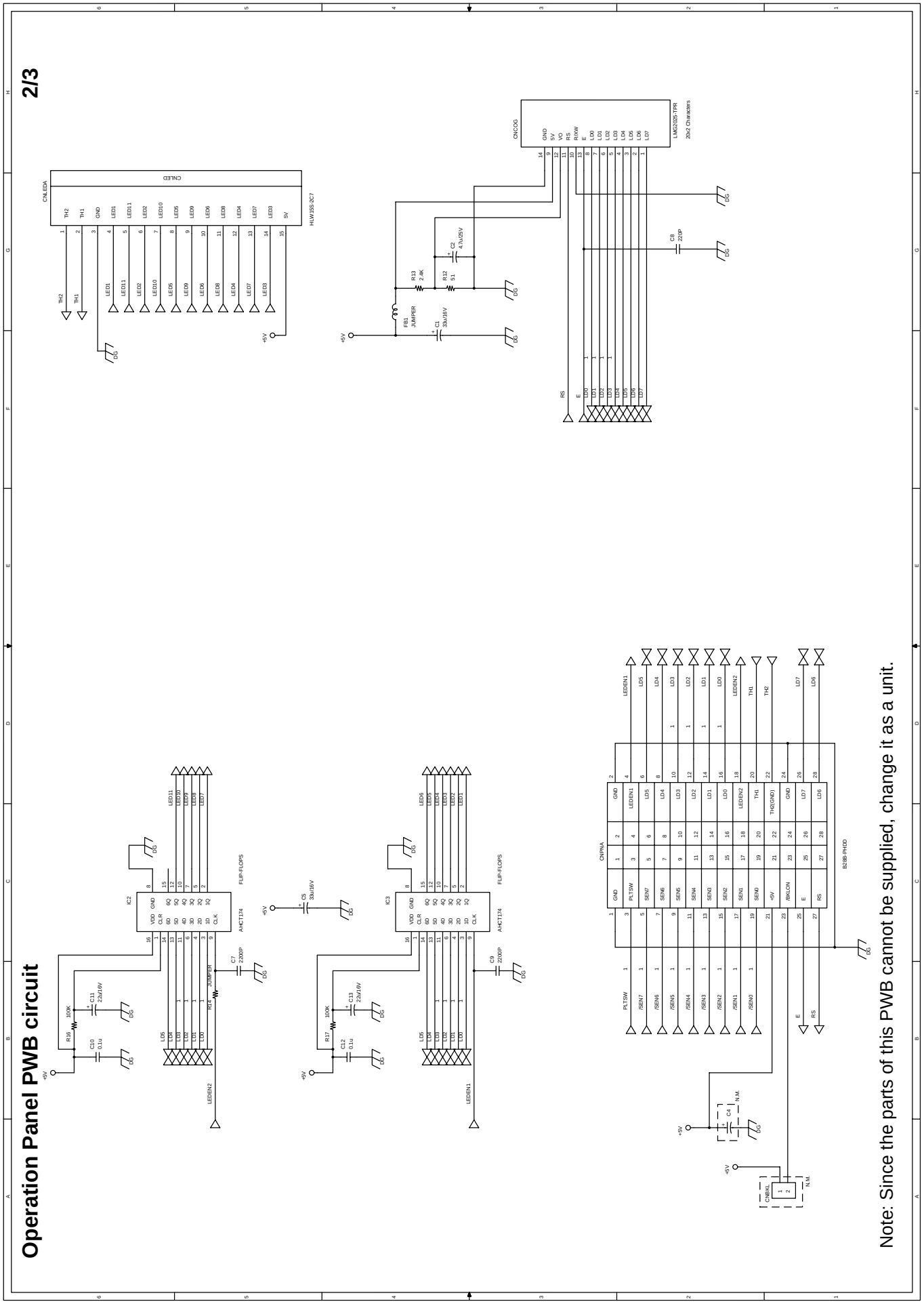
← The **Power supply PWB** of this model employs lead-free solder.

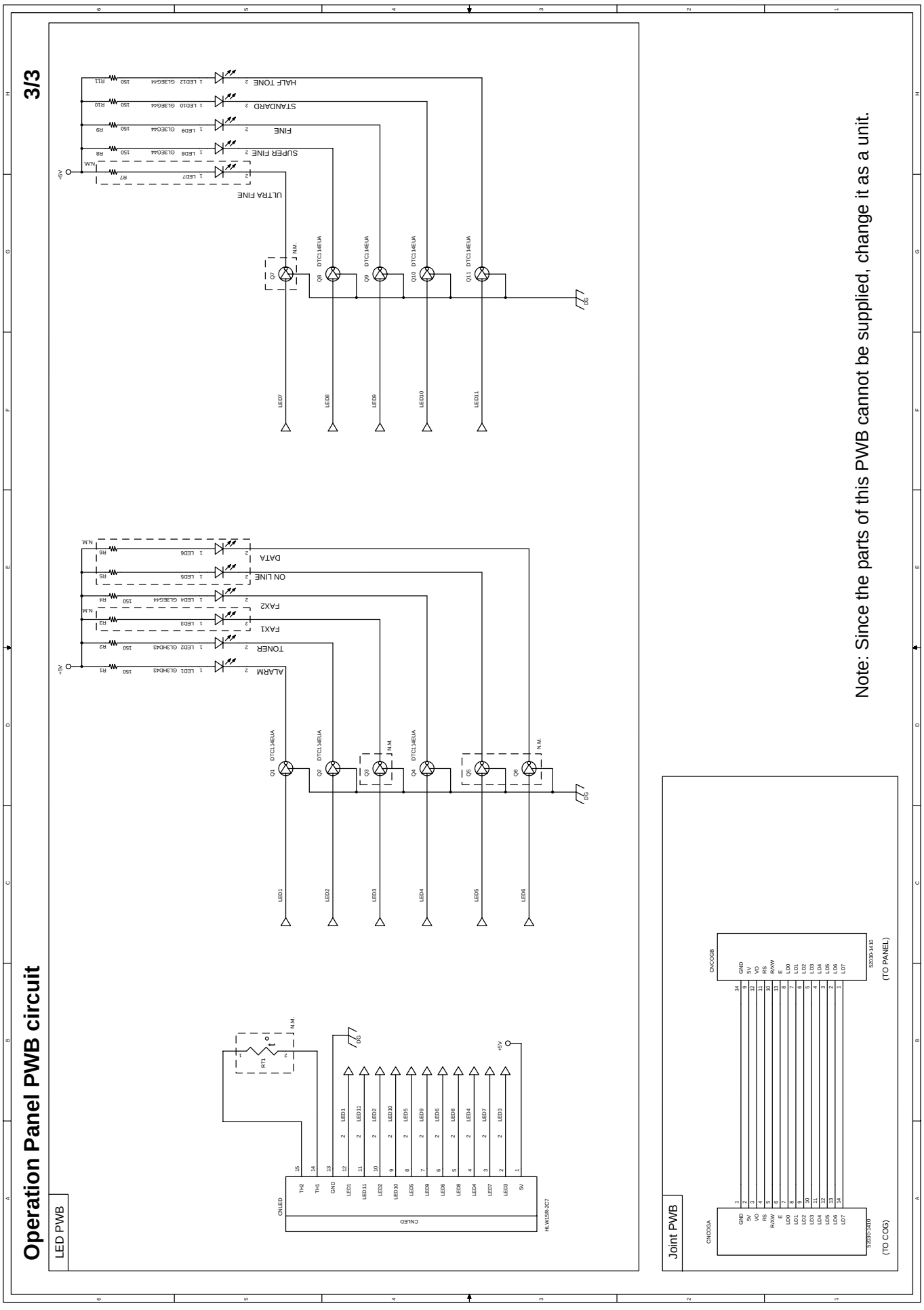
[5] Operation Panel PWB circuit

1/3



Note: Since the parts of this PWB cannot be supplied, change it as a unit.

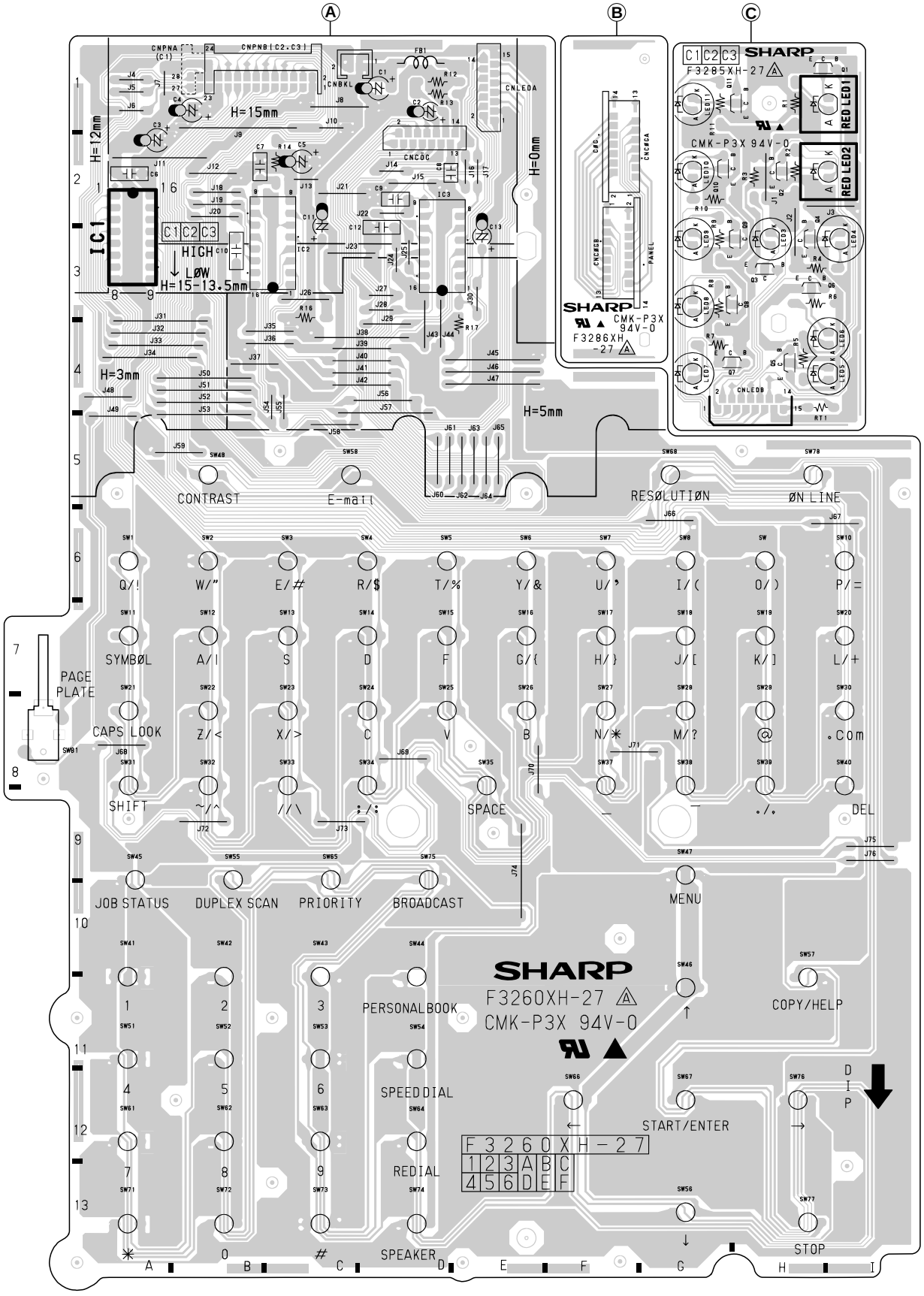

2/3
Operation Panel PWB circuit
CN.LED
CNLED
H1W155-2C7
LED1
LED1.1
LED2
LED10
LED5
LED9
LED6
LED8
LED4
LED7
LED3
5V
TH2
TH1
GND
CN.CCG
LMG2GS-TPR
20x2 Characters
GND
5V
VO
RS
R/W
E
LD0
LD1
LD2
LD3
LD4
LD5
LD6
LD7
FB1
JUMPER
C1
33u/16V
R13
2.4K
R12
5.1
C2
4.7u/25V
C8
220P
IC2
IC3
AHCT174
FLIP-FLOPS
VDD
GND
CLR
CLK
1D
1Q
2D
2Q
3D
3Q
4D
4Q
5D
5Q
6D
6Q
C5
33u/16V
C7
220P
C9
220P
R16
100K
R17
100K
C10
0.1u
C11
22u/16V
C12
0.1u
C13
22u/16V
JUMPER
LEDEN1
LEDEN2
CN.PNA
B2(B)-PHDD
PLTSW
GND
ISEN7
ISEN6
ISEN5
ISEN4
ISEN3
ISEN2
ISEN1
ISEN0
TH1
TH2(GND)
/BKLON
C4
N.M.
CNBKL
Note: Since the parts of this PWB cannot be supplied, change it as a unit.


3/3
Operation Panel PWB circuit
LED PWB
Joint PWB
Note: Since the parts of this PWB cannot be supplied, change it as a unit.
(TO PANEL)
(TO COG)
CNCOGA
CNCOGB
CNLED
HEAD
HALF TONE
STANDARD
FINE
SUPER FINE
ULTRA FINE
ON LINE
DATA
FAX2
FAX1
TONER
ALARM
N.M.
DTC114EUA
GL3EG44
GL3HD43
+5V
DG

Operation panel PWB parts layout

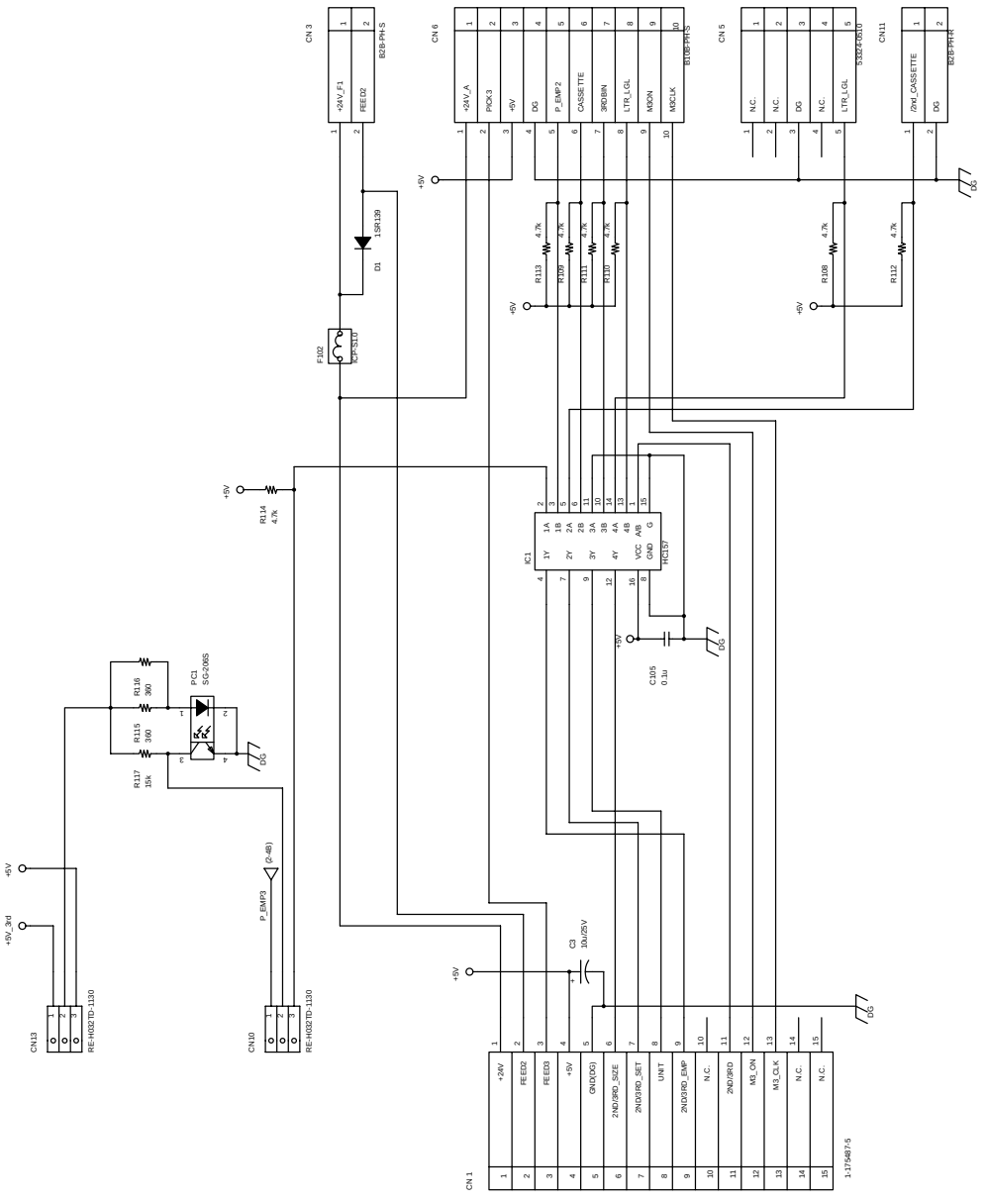
Note: Since the parts of this PWB cannot be supplied, change it as a unit.

No.	DESCRIPTION	PARTS CODE
Ⓐ	Panel PWB unit	DCEKP425CXHP1
Ⓑ	Joint PWB unit	DCEKP425CHXL1
Ⓒ	LED PWB unit	DCEKP425CXHI1



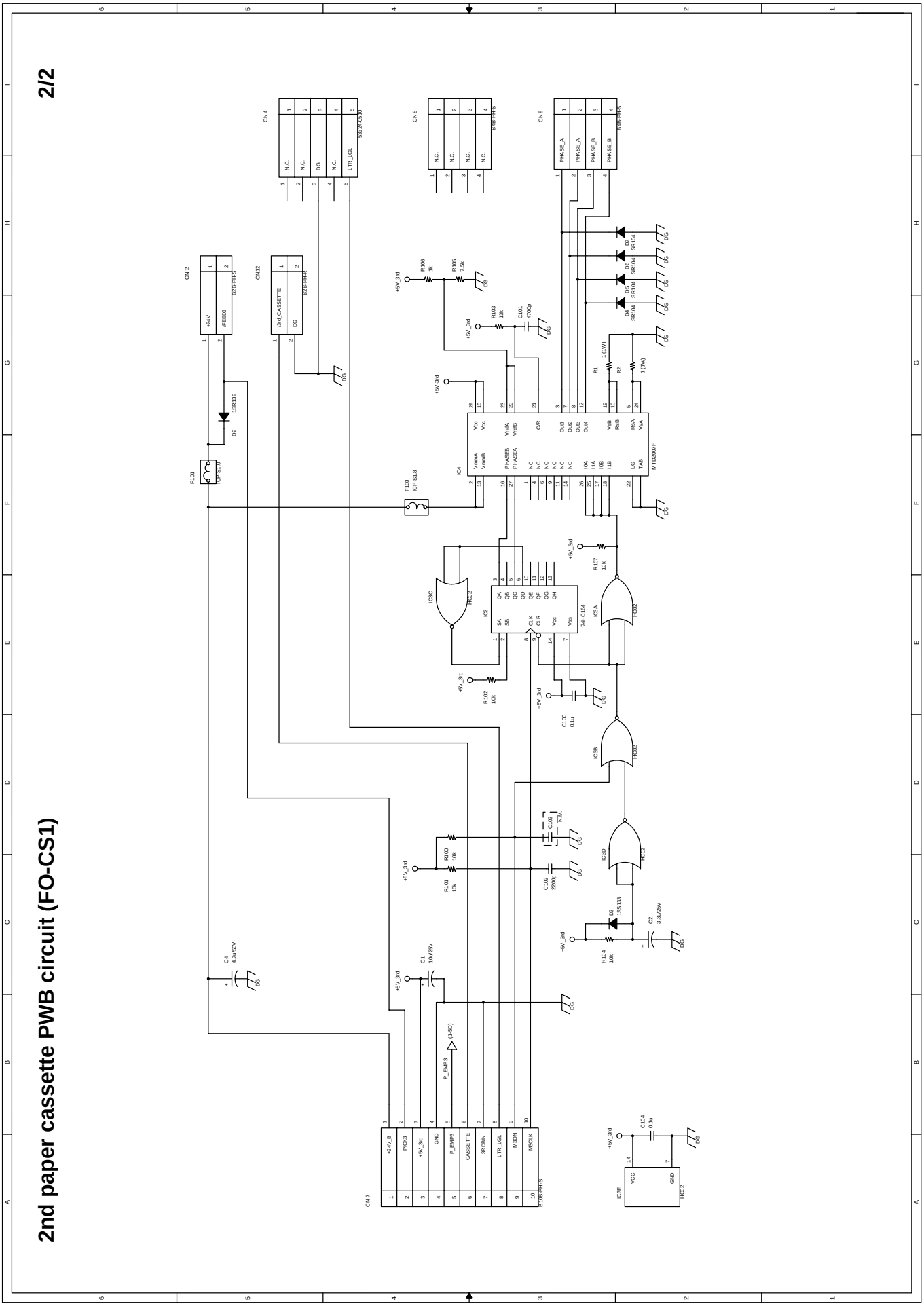
[6] 2nd paper cassette PWB circuit (FO-CS1)

1/2

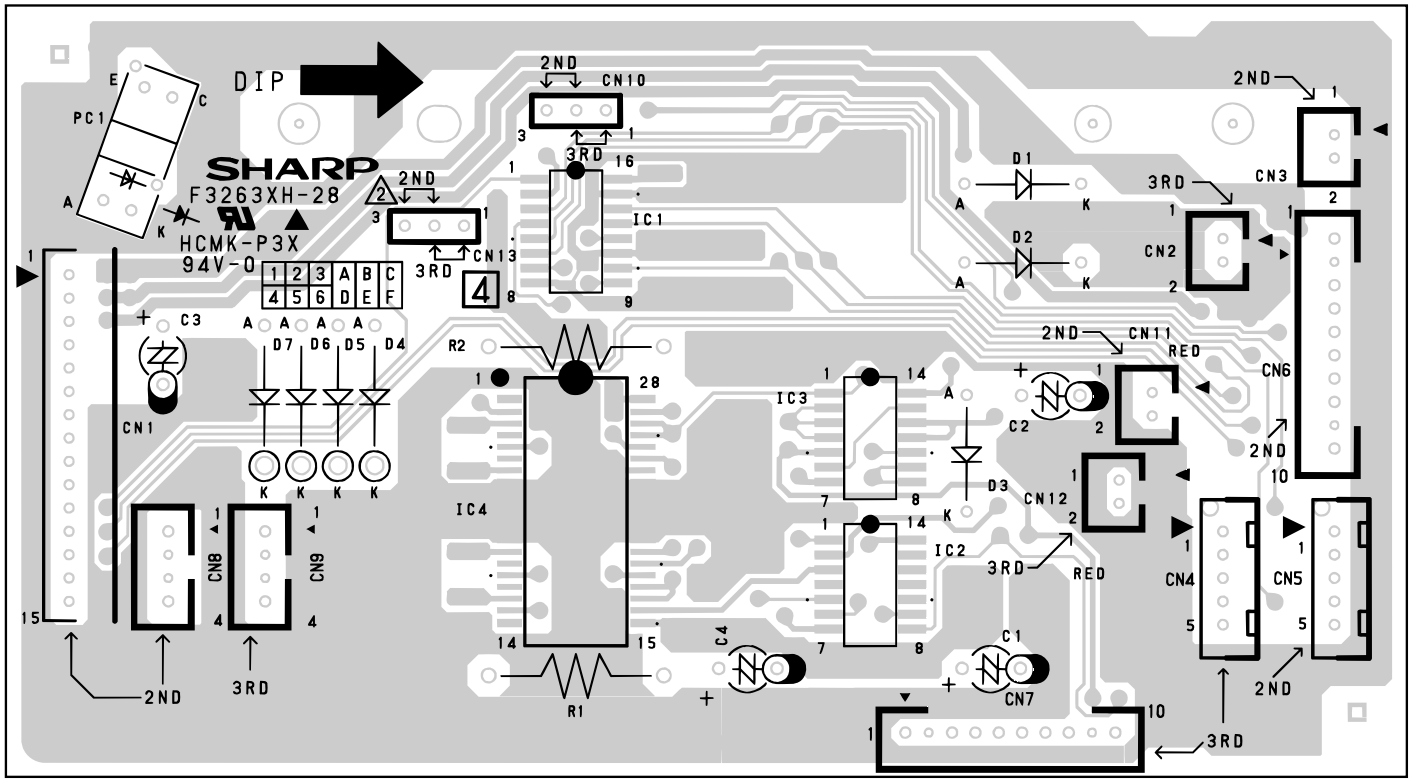


2nd paper cassette PWB circuit (FO-CS1)

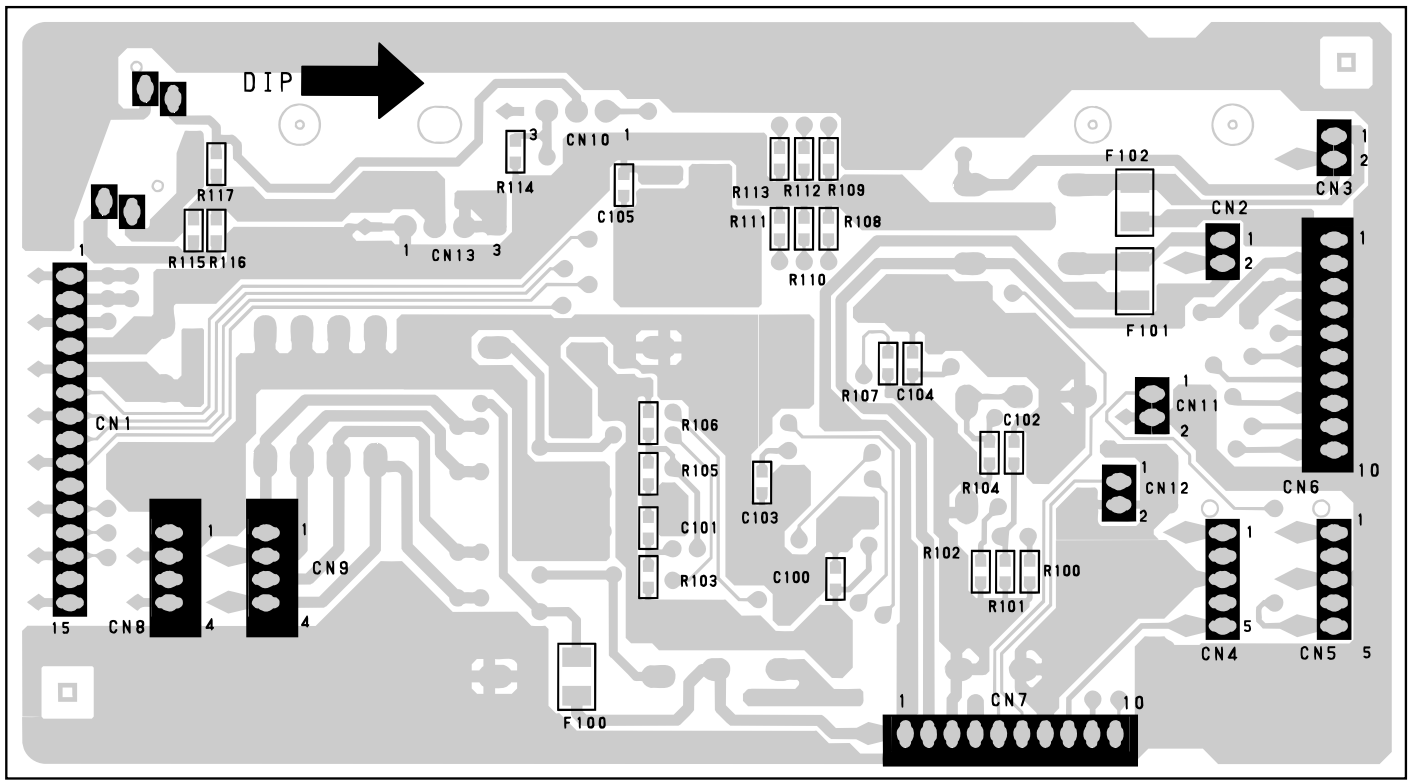
2/2



2nd paper cassette PWB parts layout (Top side) (FO-CS1)



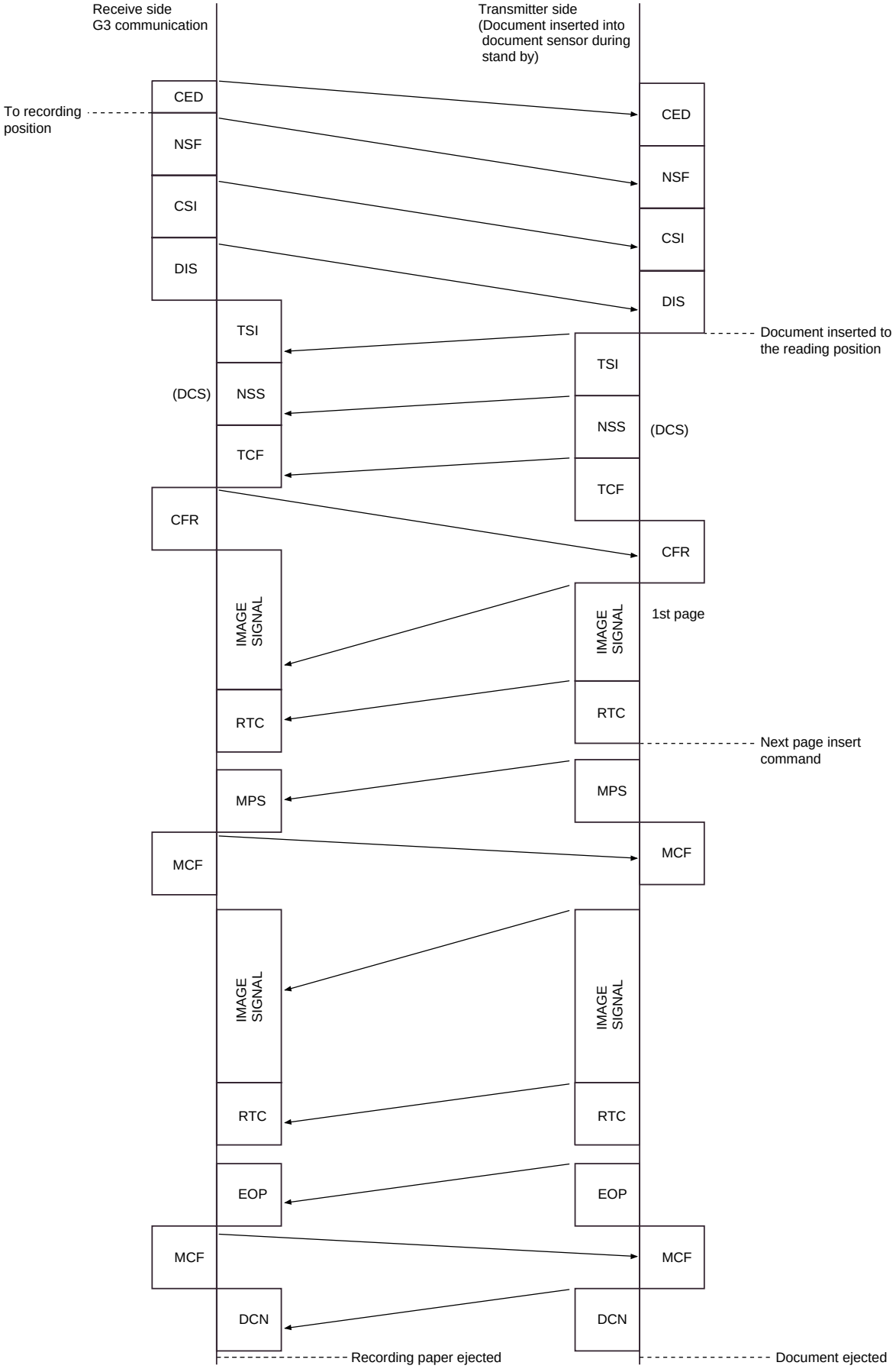
2nd paper cassette PWB parts layout (Bottom side) (FO-CS1)



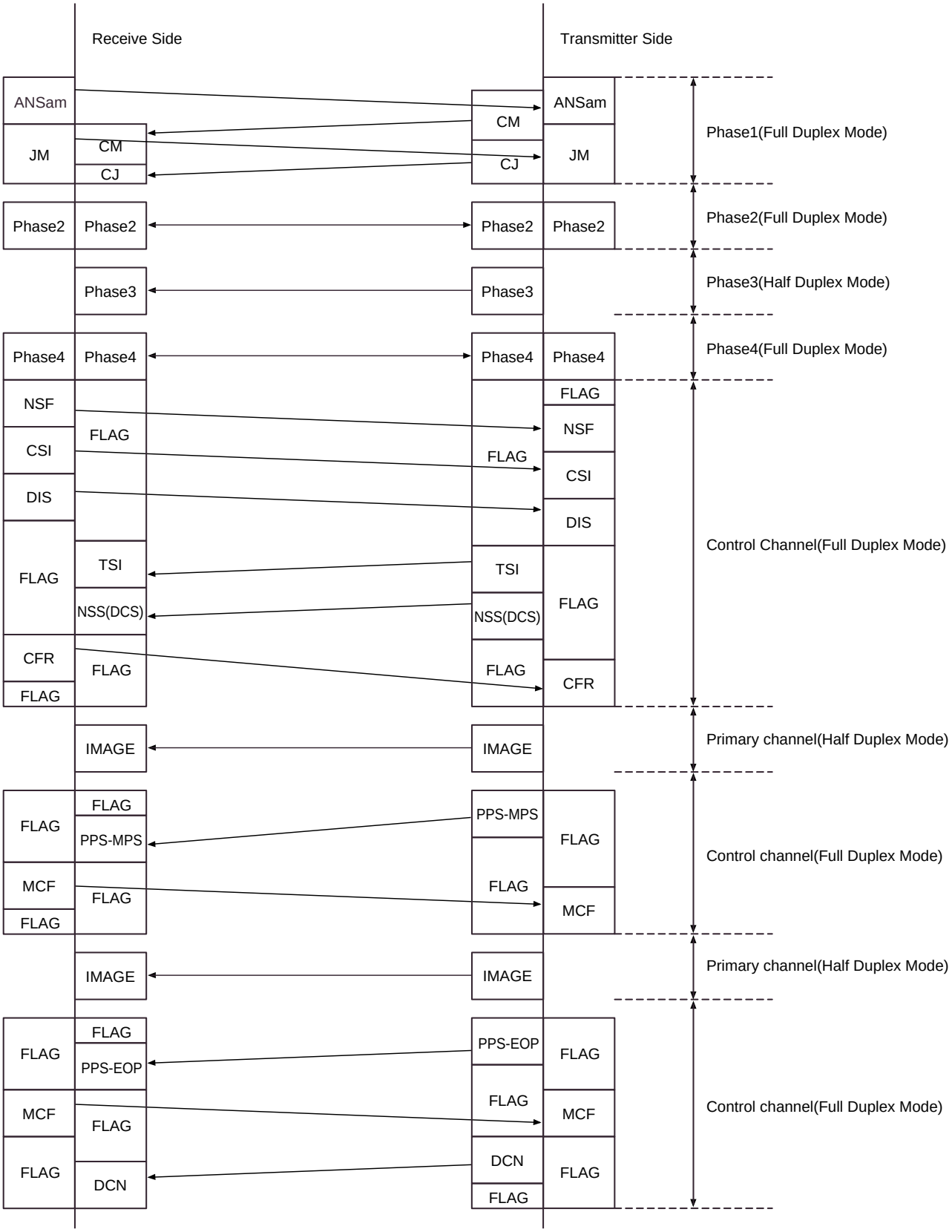
M E M O

CHAPTER 7. OPERATION FLOWCHART

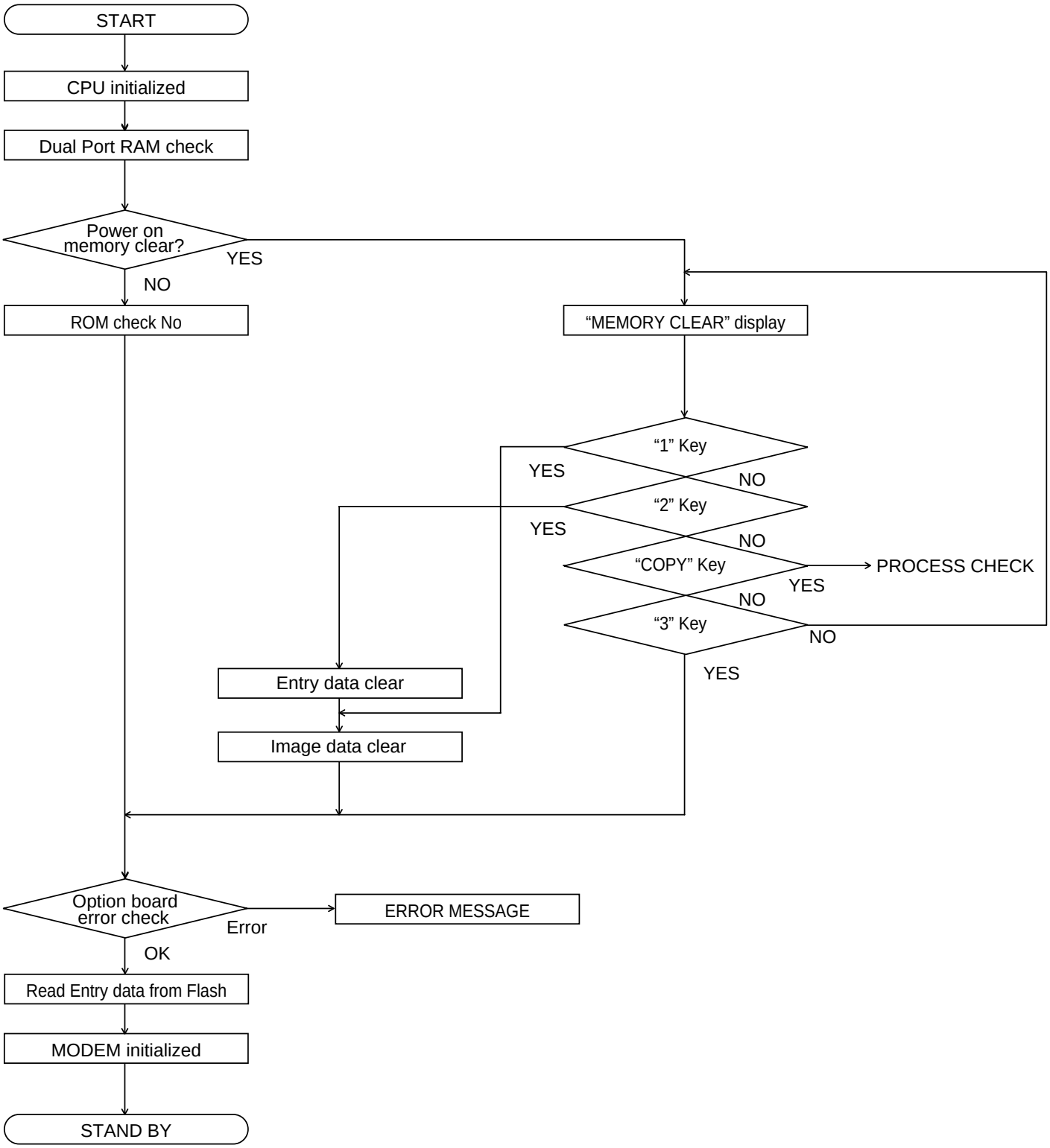
[1] G3 Protocol



[2] Super G3 Protocol



[3] Power On Sequence



CHAPTER 8. OTHERS

[1] Service Tools

1.CONNECTION

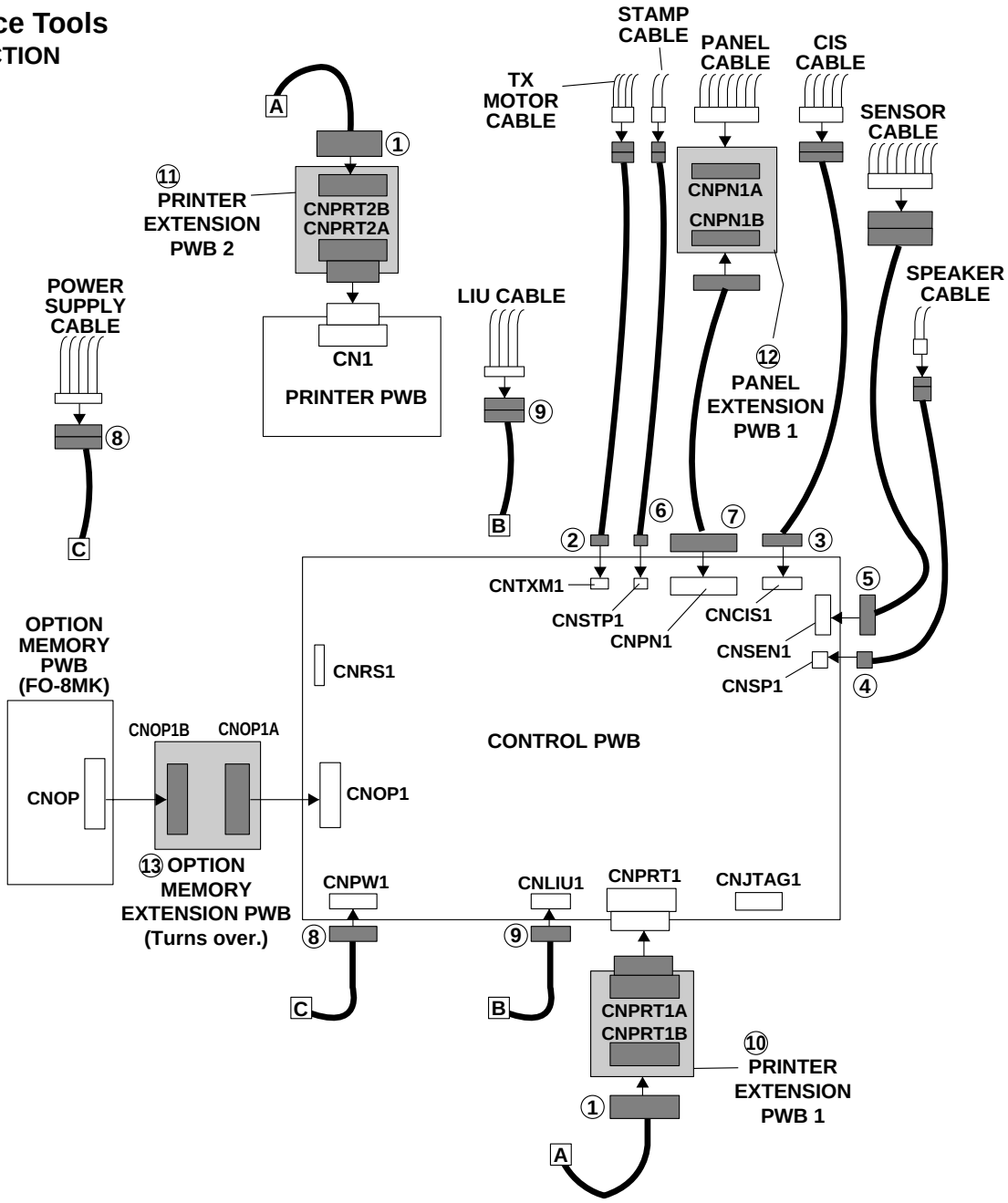


Fig. 1

2. Extension list

NO.	PARTS CODE	DESCRIPTION	Q'TY	PRICE RANK
1	QCNW-4559SCZZ	PRINTER EXTENSION PWB CABLE	1	FX
2	QCNWN313BSCZZ	TX MOTOR EXTENSION CABLE	1	AM
3	QCNWN314BSCZZ	CIS EXTENSION CABLE	1	AT
4	QCNWN315BSCZZ	SPEAKER EXTENSION CABLE	1	AH
5	QCNWN316BSCZZ	SENSOR EXTENSION CABLE	1	AR
6	QCNWN317BSCZZ	STAMP EXTENSION CABLE	1	AH
7	QCNWN261BXHZZ	PANEL EXTENSION CABLE	1	BC
8	QCNWN318SCHZZ	POWER SUPPLY EXTENSION CABLE	1	AU
9	QCNWN319BSCZZ	LIU EXTENSION CABLE	1	AS
10	DUNT-459CSC01	PRINTER EXTENSION PWB 1	1	CH
11	DUNT-459CSC02	PRINTER EXTENSION PWB 2	1	CH
12	DUNT-459CSC04	PANEL EXTENSION PWB 1	1	CH
13	DUNT-459CSC03	OPTION MEMORY EXTENSION PWB	1	CH

[2] Rewriting version up the FLASH ROM

1. Outline

FO-4400 is connected with PC in a serial cable, and Firmware of FO-4400 is downloaded.

2. Preparation

PC side:

(1) Communication software (Tera Term Pro Version 2.3 (free software)) is installed.
It distributes separately. (ttermp23.zip)
- ttermp23.zip is decompressed to the suitable directory.
- Setup.exe is double-clicked and installed.
- Start Tera Term and set up Serial Port. Figs. 2, 3, 4)

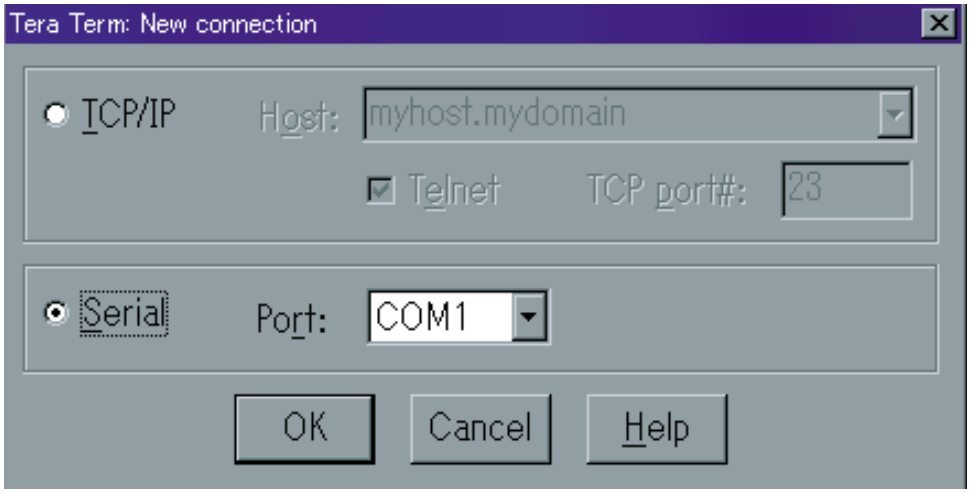


Fig. 2

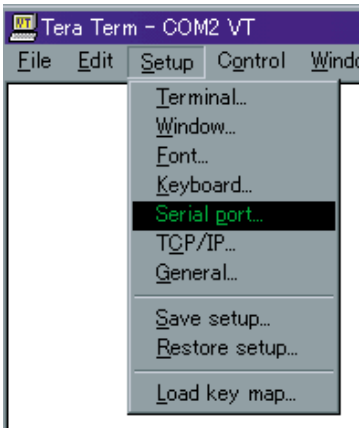


Fig. 3

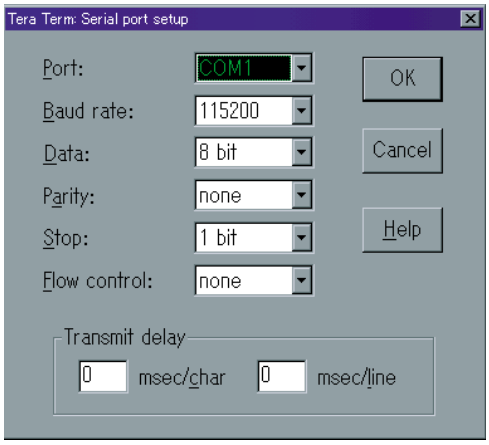


Fig. 4

Note: According to the environment of PC to be used, one of COM1 and COM2 is chosen.

(2) The file of the firmware to update is copied to a suitable directory.
(The extension of the file for update is “ver”.)

FO-4400 side:

(1) Turn off the power.
(2) The door for option board wearing in the back of FO-4400 is opened.
(3) The conversion cable of 9pin - 5pin is connected the white connector which has five pins.
(The connector is at the upper left of the door.)
(4) FO-4400 is connected with PC with a serial straight cable and a conversion cable.

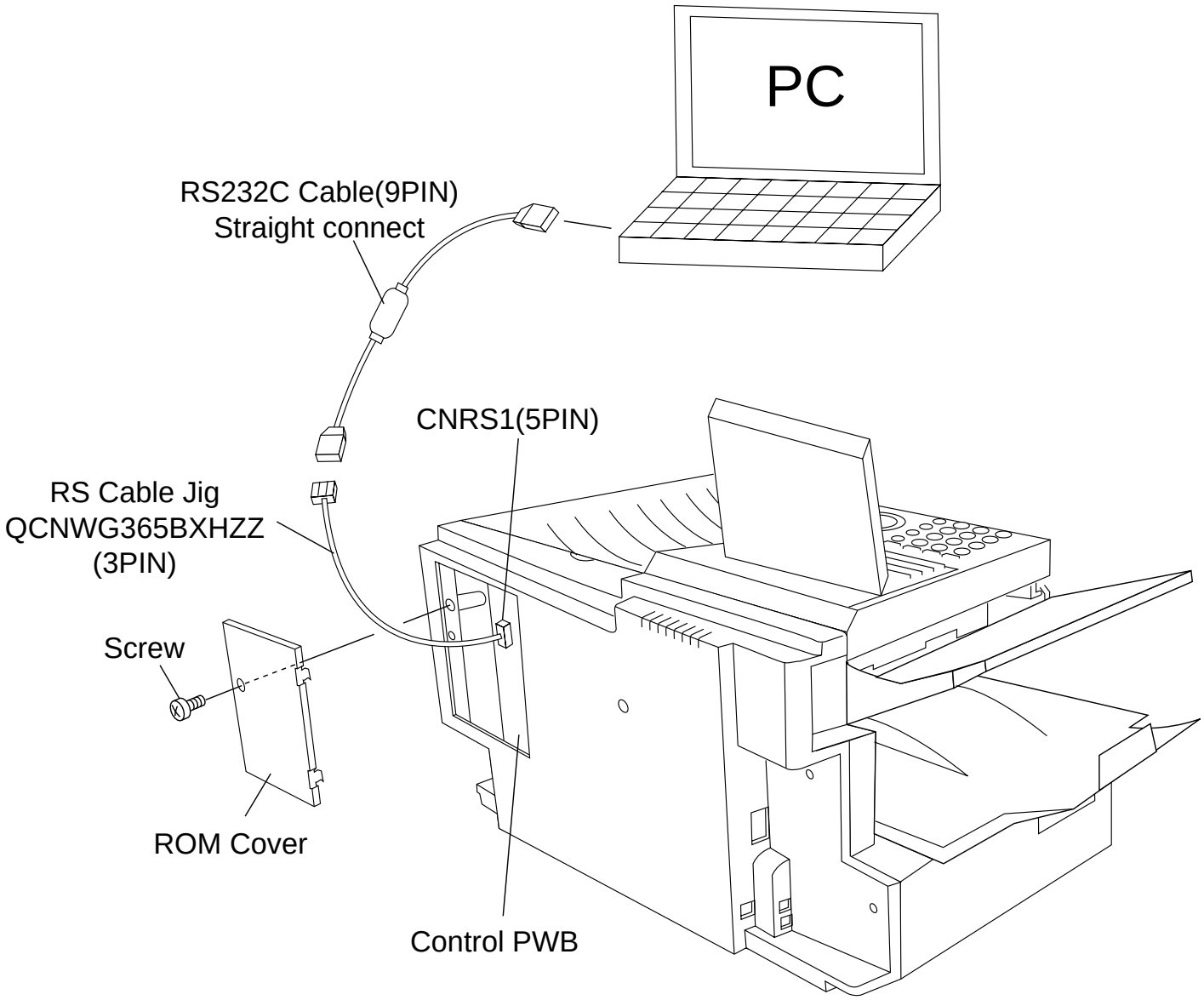


Fig. 5 Connected cable

PART CORD	PRICE RANK	NAME	REMARKS
QCNWG365BXHZZ	BH	RS cable JIG (3PIN)	Connects RS-232C cable and CNRS1(Control PWB)

3. Operating Procedure

FO-4400	PC
(1) Turn on the power, pushing “START”+“STOP”.	
MEMORY CLEAR 1=ALL, 2=IMAGE, 3=NO	
(2) Push “MENU”.	
Flash Loader	
	(3) Start Tera Term Pro.
	(4) [File]-[Send File] is chosen. (Fig.5)
	(5) [Option] Binary is checked. (Fig.6) Double-click the file to download. A file transfer is started.
The size of a firmware file is 2.5MB. Transmission takes about 4 minutes and 30 seconds.	
(6) After transmission is completed, write in a flash memory.	
Flash Loader Writing	
Note: Never turn off the power, when displayed as “Writing”.	
Note: When not displayed as “Writing”, please turn off the power and redo from the beginning.	
(7) After about 30 seconds,	
OK Reset Machine	
(8) Turn off the power.	

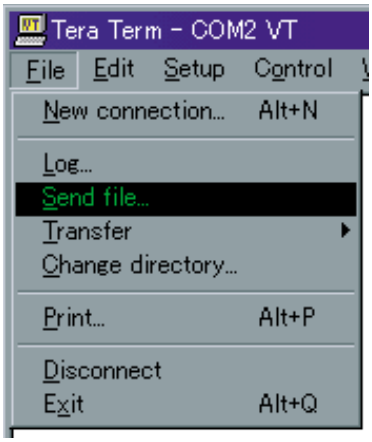


Fig. 6

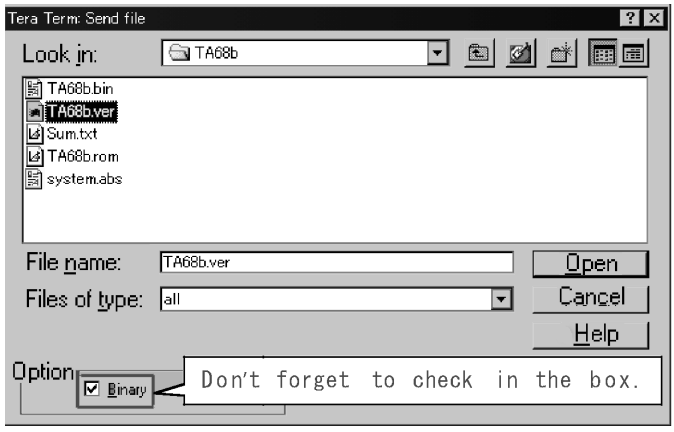


Fig. 7